THE

AMERICAN EPHEMERIS

/ / 7 6 2 6

AND

NAUTICAL ALMANAC

FOR THE YEAR

1 9 0 2

FIRST EDITION

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WASHINGTON
BUREAU OF EQUIPMENT
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PREFACE.

WHILE the general arrangement of the *American Ephemeris* remains substantially the same as in 1901, some changes have been introduced in the present volume which may be briefly stated as follows: First, a new and more accurate formula has been adopted for the semi-diameter of the Moon. Second, although four-place logarithms usually suffice for reducing stars from mean to apparent place, greater exactness is sometimes required in dealing with observations for variation of latitude, and on that account the number of decimals in the logarithms of the Besselian star-numbers A, C, D, and in the logarithms of the independent star-numbers g and h, have been increased from four to five, and the tenths have been added to the minutes in the arcs G and H. Third, the star-numbers, apparent places of stars, and other data based on the constants of the PARIS CONFERENCE of 1896 have been placed in a subdivision entitled Part IV. The printing of two distinct sets of constants for precession, nutation, aberration, and mean obliquity of the ecliptic, is regarded as a temporary expedient, and Part IV will doubtless be abolished as soon as there is a well-pronounced agreement among astronomers respecting the constants which should be used. Fourth, in the explanations of the arrangement, use, and construction of the *American Ephemeris*, the formulæ for computing solar eclipses have been somewhat improved, and the instructions for predicting occultations at a given place have been completely rewritten.

The Ephemeris is divided into four parts, as follows:

Part I, *Ephemeris for the Meridian of Greenwich*, which gives the ephemerides of the Sun and Moon, the geocentric and heliocentric positions of the major planets, the Sun's co-ordinates, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, which gives the ephemerides of the fixed stars, Sun, Moon, and major planets for transit over the meridian of the new Naval Observatory, Washington. The mean places of the fixed stars and the data for their reduction are also included in this part.

Part III, *Phenomena*, which contains predictions of phenomena to be observed, with data for their computation. Washington mean time for the meridian of the new Naval Observatory is used throughout this part except in a few cases, notably those of eclipses, where Greenwich mean time seems more convenient.

Part IV, *Star numbers, apparent places of stars, and other data based on the Constants of the Paris Conference of 1896*, which gives precession, obliquity, etc., Besselian star-numbers, independent star-numbers, ephemerides of the four northern circumpolar stars, and ephemerides of twenty five other stars whose apparent places differ from those given in Part II.

<div style="text-align:right">

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WASHINGTON, *June, 1899.*
EPH 1902——III

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CORRECTIONS.

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31,	Moon's Apogee,	*for* h m	*read* d h
92,	Equation of time, June 4,	*for* 2ᵐ 58.59ˢ	*read* 1ᵐ 58.59ˢ
—,	Preface, sixth line from top,	*for* 9.2231″	*read* 9.2240″
289,	Seventh line from bottom,	*after* $(G + a_0)$	*insert* tan δ_0
308,	Seventeenth line from bottom, a^2 Capricorni,	*for* −12° 51′ 17.01″	*read* −12° 51′ 17 50″
308,	Seventeenth line from bottom, a^2 Capricorni,	*for* +10.977	*read* +10.963
343,	Apparent places of *a* Canis Majoris (*Sirius*),		*add* + 0.08ˢ to all the Right Ascensions, *and* + 0.1″ to all the Declinations.
385,	a^2 Capricorni,		*add* −0.5″ to all the Declinations.
434,	For second line,		*read* 19° 33.3′; 112° 58.4′; 19° 50.3′; 111° 46.7′; 20° 2.6′; 110° 45.6′; 0ᵐ 37.7ˢ
438,	Change χ^1 and χ^2 Tauri to κ^1 and κ^2 Tauri on pp. 438, 442, 445, 447, 449, 456, 459, 461, 464, 466, 468, 470, and 472.		
438,	Twentieth line, decl. of δ Arietis,	*for* + 19° 26′ 55.20″	*read* + 19° 20′ 55.20″
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439,	Fourth line from bottom, decl. of 34 Sextantis,	*for* + 5° 6′ 19.62″	*read* + 4° 6′ 19.62″
440,	R. A. of λ Libræ,	*for* 15ʰ 47ᵐ 33.614ˢ	*read* 15ʰ 47ᵐ 31.614ˢ
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500,	November 8,	*for* 17ʰ 15ᵐ	*read* 16ʰ 54ᵐ
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529,	Ninth line from bottom,	*for* 416	*read* 434
536,	Fifth line from bottom,	*for* − x′τ	*read* = x′τ
541,	Obliquity,	*for* 20° 27′ 8.26″	*read* 23° 27′ 8.26″
541,	Corrections to Sirius for the effect of orbital motion,	*for* − 0.077ˢ	*read* + 0.002ˢ
		for − 0.097ˢ	*read* − 0.017ˢ
		for + 1.22″	*read* + 1.34″
		for + 1.13″	*read* + 1.26″
541,	Second line from bottom,	*for* 16′ 59.63″	*read* 15′ 59.63″
545,		*for* 0ᵐ 43 922ˢ	*read* 0ᵐ 42.922ˢ
547,		*for* 3ᵐ 34.248ˢ	*read* 3ᵐ 34.284ˢ

Ephemeris, 1901.

Page.			
31,	Moon's Apogee and Perigee,	*for* h m	*read* d h
345,	Apparent places of *a* Canis Majoris (*Sirius*),		*add* + 0.08ˢ to all the Right Ascensions, *and* + 0.1″ to all the Declinations.
551,	Tuscaloosa, long. from Washington,	*for* − 0ʰ 41ᵐ 56.03ˢ	*read* + 0ʰ 41ᵐ 56.03ˢ
581,	Corrections to Sirius for the effect of orbital motion,	*for* − 0.097ˢ	*read* − 0.017ˢ
		for − 0.114ˢ	*read* − 0.034ˢ
		for + 1.13″	*read* + 1.26″
		for + 1.02″	*read* + 1.17″

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

The year 6615 of the Julian Period;

    "   7410–7411 of the Byzantine era, the year 7411 commencing on September 1;

    "   5662–5663 of the Jewish era, the year 5663 commencing on October 2, or, more exactly, at sunset on October 1;

    "   2655 since the foundation of Rome, according to VARRO;

    "   2649 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period; corresponding, in the notation of chronologists, to the 747th, and, in the notation of astronomers, to the 746th year before the birth of CHRIST;

    "   2678 of the Olympiads, or the second year of the 670th Olympiad, commencing in July, 1902, if we fix the era of the Olympiads at 775½ years before CHRIST, or near the beginning of July of the year 3938 of the Julian Period;

    "   2214 of the Grecian era, or the era of the SELEUCIDÆ, which began near the vernal equinox of the year, − 311 = B. C. 312, = 4402 of the Julian Period;

    "   1618 of the era of DIOCLETIAN;

    "   2562 of the Japanese era and to the 35th year of the period entitled "Meiji."

The year 1320 of the Mohammedan era, or the era of the Hegira, begins on the 10th day of April, 1902.

The first day of January of the year 1902 is the 2,415,751st day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	E	Solar Cycle	7
Epact	21	Roman Indiction	15
Lunar Cycle or Golden Number .	3	Julian Period	6615

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.		♂	Mars.
☾	The Moon.		♃	Jupiter.
☿	Mercury.		♄	Saturn.
♀	Venus.		♅	Uranus.
⊕	The Earth.		♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs. { 1. ♈ Aries. 2. ♉ Taurus. 3. ♊ Gemini.

Summer Signs. { 4. ♋ Cancer. 5. ♌ Leo. 6. ♍ Virgo.

Autumn Signs. { 7. ♎ Libra. 8. ♏ Scorpius. 9. ♐ Sagittarius.

Winter Signs. { 10. ♑ Capricornus. 11. ♒ Aquarius. 12. ♓ Pisces.

ASPECTS.

☌ Conjunction, or having the same Longitude or Right Ascension.
□ Quadrature, or differing ±90° in Longitude or Right Ascension.
☍ Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

☊	Ascending Node.		°	Degrees.
☋	Descending Node.		′	Minutes of Arc.
N .	North.		″	Seconds of Arc.
S .	South.		ʰ	Hours.
E .	East.		ᵐ	Minutes of Time.
W.	West.		ˢ	Seconds of Time.

PART I

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH.

JANUARY, 1902.

AT GREENWICH APPARENT NOON.

| Day of the Week | Day of the Month | THE SUN'S | | | | | Sidereal Time of Semi-diameter Passing Meridian. | Equation of Time, to be Added to Apparent Time. | Diff. for 1 Hour. |
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	o ' "	"	' "	s	m s	s
Wed.	1	18 44 14.20	+ 11.051	S. 23 03 38.1	+ 11.68	16 17.13	71.02	3 25.09	1.192
Thur.	2	18 48 39.26	11.038	22 58 44.0	12.83	16 17.12	70.98	3 53.53	1.180
Frid.	3	18 53 04.01	11.024	22 53 22.3	13.98	16 17.12	70.93	4 21.66	1.166
Sat.	4	18 57 28.40	+ 11.009	22 47 33.2	+ 15.11	16 17.11	70.88	4 49.41	1.149
SUN.	5	19 01 52.42	10.992	22 41 16.9	16.24	16 17.09	70.82	5 16.80	1.132
Mon.	6	19 06 16.02	10.974	22 34 33.6	17.36	16 17.07	70.75	5 43.77	1.115
Tues.	7	19 10 39.19	+ 10.955	22 27 23.5	+ 18.48	16 17.05	70.69	6 10.31	1.096
Wed.	8	19 15 01.88	10.935	22 19 46.8	19.58	16 17.02	70.62	6 36.37	1.075
Thur.	9	19 19 24.08	10.913	22 11 43.7	20.68	16 16.99	70.55	7 01.93	1.054
Frid.	10	19 23 45.73	+ 10.890	22 03 14.5	+ 21.76	16 16.95	70.48	7 26.96	1.031
Sat.	11	19 28 06.82	10.866	21 54 19.4	22.83	16 16.91	70.41	7 51.43	1.007
SUN.	12	19 32 27.33	10.842	21 44 58.8	23.89	16 16.87	70.33	8 15.31	0.982
Mon.	13	19 36 47.22	+ 10.816	21 35 12.9	+ 24.94	16 16.82	70.25	8 38.59	0.956
Tues.	14	19 41 06.46	10.788	21 25 02.0	25.97	16 16.76	70.16	9 01.21	0.929
Wed.	15	19 45 25.04	10.760	21 14 26.3	27.00	16 16.70	70.07	9 23.17	0.901
Thur.	16	19 49 42.94	+ 10.731	21 03 26.3	+ 28.01	16 16.63	69.97	9 44.46	0.872
Frid.	17	19 54 00.13	10.701	20 52 02.1	29.01	16 16.55	69.88	10 05.03	0.842
Sat.	18	19 58 16.59	10.670	20 40 14.2	29.99	16 16.47	69.78	10 24.88	0.812
SUN.	19	20 02 32.31	+ 10.639	20 28 02.9	+ 30.96	16 16.39	69.68	10 44.00	0.781
Mon.	20	20 06 47.28	10.608	20 15 28.5	31.91	16 16.30	69.58	11 02.36	0.749
Tues.	21	20 11 01.49	10.576	20 02 31.2	32.86	16 16.21	69.48	11 19.96	0.717
Wed.	22	20 15 14.92	+ 10.543	19 49 11.5	+ 33.78	16 16.11	69.37	11 36.79	0.685
Thur.	23	20 19 27.57	10.511	19 35 29.6	34.69	16 16.01	69.26	11 52.84	0.653
Frid.	24	20 23 39.44	10.478	19 21 26.1	35.59	16 15.90	69.15	12 08.11	0.620
Sat.	25	20 27 50.51	+ 10.445	19 07 01.1	+ 36.48	16 15.79	69.05	12 22.59	0.588
SUN.	26	20 32 00.81	10.412	18 52 15.1	37.35	16 15.68	68.94	12 36.29	0.555
Mon.	27	20 36 10.31	10.379	18 37 08.3	38.20	16 15.56	68.83	12 49.20	0.522
Tues.	28	20 40 19.01	+ 10.346	18 21 41.2	+ 39.04	16 15.44	68.72	13 01.30	0.488
Wed.	29	20 44 26.90	10.313	18 05 54.2	39.86	16 15.31	68.61	13 12.62	0.454
Thur.	30	20 48 34.00	10.279	17 49 47.7	40.67	16 15.18	68.50	13 23.12	0.421
Frid.	31	20 52 40.29	10.245	17 33 22.2	41.46	16 15.04	68.38	13 32.84	0.388
Sat.	32	20 56 45.77	+ 10.211	S. 17 16 37.8	+ 42.23	16 14.90	68.26	13 41.74	0.355

NOTE.—The mean time of semidiameter passing meridian may be found by subtractin: 0 19ˢ from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, to be Subtracted from Mean Time. | Diff. for 1 Hour. | Sidereal Time, or Right Ascension of Mean Sun. |
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	18 44 13.57	+ 11.047	S. 23 03 38.8	+ 11.68	3 25.05	− 1.192	18 40 48.53
Thur.	2	18 48 38.54	11.034	22 58 44.8	12.82	3 53.45	1.180	18 44 45.09
Frid.	3	18 53 03.21	11.020	22 53 23.3	13.97	4 21.57	1.166	18 48 41.64
Sat.	4	18 57 27.52	+ 11.005	22 47 34.4	+ 15.10	4 49.32	− 1.149	18 52 38.20
SUN.	5	19 01 51.46	10.989	22 41 18.3	16.23	5 16.70	1.132	18 56 34.76
Mon.	6	19 06 14.98	10.971	22 34 35.2	17.35	5 43.66	1.115	19 00 31.32
Tues.	7	19 10 38.07	+ 10.952	22 27 25.4	+ 18.46	6 10.20	− 1.096	19 04 27.87
Wed.	8	19 15 00.68	10.931	22 19 48.9	19.56	6 36.25	1.075	19 08 24.43
Thur.	9	19 19 22.80	10.910	22 11 46.1	20.66	7 01.81	1.054	19 12 20.99
Frid.	10	19 23 44.38	+ 10.887	22 03 17.2	+ 21.74	7 26.84	− 1.031	19 16 17.54
Sat.	11	19 28 05.40	10.864	21 54 22.4	22.81	7 51.30	1.007	19 20 14.10
SUN.	12	19 32 25.84	10.839	21 45 02.1	23.87	8 15.18	0.982	19 24 10.66
Mon.	13	19 36 45.66	+ 10.813	21 35 16.5	+ 24.92	8 38.45	− 0.956	19 28 07.21
Tues.	14	19 41 04.84	10.785	21 25 05.9	25.95	9 01.07	0.929	19 32 03.77
Wed.	15	19 45 23.36	10.757	21 14 30.5	26.98	9 23.03	0.901	19 36 00.33
Thur.	16	19 49 41.20	+ 10.728	21 03 30.8	+ 27.99	9 44.32	− 0.872	19 39 56.88
Frid.	17	19 53 58.33	10.698	20 52 07.0	28.99	10 04.89	0.842	19 43 53.44
Sat.	18	19 58 14.74	10.668	20 40 19.4	29.97	10 24.74	0.812	19 47 50.00
SUN.	19	20 02 30.41	+ 10.637	20 28 08.4	+ 30.94	10 43.86	− 0.781	19 51 46.55
Mon.	20	20 06 45.33	10.606	20 15 34.3	31.89	11 02.22	0.749	19 55 43.11
Tues.	21	20 10 59.49	10.574	20 02 37.4	32.84	11 19.82	0.717	19 59 39.67
Wed.	22	20 15 12.88	+ 10.542	19 49 18.0	+ 33.77	11 36.66	− 0.685	20 03 36.22
Thur.	23	20 19 25.49	10.509	19 35 36.5	34.68	11 52.71	0.653	20 07 32.78
Frid.	24	20 23 37.32	10.477	19 21 33.3	35.58	12 07.99	0.620	20 11 29.33
Sat.	25	20 27 48.36	+ 10.444	19 07 08.6	+ 36.47	12 22.47	− 0.588	20 15 25.89
SUN.	26	20 31 58.62	10.411	18 52 22.9	37.34	12 36.18	0.555	20 19 22.44
Mon.	27	20 36 08.09	10.378	18 37 16.5	38.19	12 49.09	0.522	20 23 19.00
Tues.	28	20 40 16.76	+ 10.345	18 21 49.8	+ 39.03	13 01.20	− 0.488	20 27 15.56
Wed.	29	20 44 24.63	10.311	18 06 03.1	39.85	13 12.52	0.454	20 31 12.11
Thur.	30	20 48 31.70	10.278	17 49 56.9	40.66	13 23.03	0.421	20 35 08.67
Frid.	31	20 52 37.97	10.245	17 33 31.6	41.45	13 32.75	0.388	20 39 05.22
Sat.	32	20 56 43.44	+ 10.211	S. 17 16 47.4	+ 42.22	13 41.66	− 0.355	20 43 01.78

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,
+9.8565ˢ.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ'	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	1	280 10 08.2	9 56.3	152.91	− 0.84	9.992 6540	+ 0.2	5 18 19.18
2	2	281 11 18.2	11 06.1	152.92	0.74	9.992 6555	1.1	5 14 23.27
3	3	282 12 28.4	12 16.2	152.93	0.63	9.992 6593	2.0	5 10 27.35
4	4	283 13 38.9	13 26.5	152.93	− 0.51	9.992 6651	+ 2.8	5 06 31.44
5	5	284 14 49.5	14 37.0	152.94	0.37	9.992 6729	3.6	5 02 35.53
6	6	285 16 00.2	15 47.5	152.94	0.25	9.992 6826	.4.4	4 58 39.62
7	7	286 17 10.9	16 58.0	152.94	− 0.14	9.992 6941	+ 5.2	4 54 43.71
8	8	287 18 21.5	18 08.4	152.93	− 0.05	9.992 7074	5.9	4 50 47.80
9	9	288 19 32.0	19 18.8	152.93	+ 0.03	9.992 7225	6.6	4 46 51.89
10	10	289 20 42.2	20 28.8	152.92	+ 0.07	9.992 7392	+ 7.3	4 42 55.98
11	11	290 21 52.1	21 38.6	152.90	0.10	9.992 7576	8.0	4 39 00.07
12	12	291 23 01.6	22 47.8	152.88	0.09	9.992 7777	8.7	4 35 04.16
13	13	292 24 10.5	23 56.6	152.86	+ 0.05	9.992 7995	+ 9.5	4 31 08.24
14	14	293 25 18.8	25 04.8	152.83	− 0.02	9.992 8230	10.2	4 27 12.33
15	15	294 26 26.4	26 12.2	152.80	0.11	9.992 8484	11.0	4 23 16.42
16	16	295 27 33.2	27 18.9	152.77	− 0.23	9.992 8758	+ 11.8	4 19 20.51
17	17	296 28 39.3	28 24.8	152.73	0.34	9.992 9052	12.7	4 15 24.60
18	18	297 29 44.4	29 29.7	152.70	0.48	9.992 9369	13.7	4 11 28.69
19	19	298 30 48.6	30 33.8	152.66	− 0.60	9.992 9710	+ 14.7	4 07 32.78
20	20	299 31 51.8	31 36.9	152.62	0.71	9.993 0075	15.8	4 03 36.87
21	21	300 32 54.2	32 39.1	152.58	0.81	9.993 0466	16.9	3 59 40.96
22	22	301 33 55.6	33 40.5	152.54	− 0.88	9.993 0884	+ 18.0	3 55 45.05
23	23	302 34 56.2	34 40.8	152.51	0.92	9.993 1330	19.2	3 51 49.14
24	24	303 35 56.0	35 40.5	152.47	0.94	9.993 1803	20.3	3 47 53.23
25	25	304 36 55.0	36 39.3	152.44	− 0.91	9.993 2303	+ 21.4	3 43 57.32
26	26	305 37 53.2	37 37.4	152.41	0.86	9.993 2831	22.5	3 40 01.41
27	27	306 38 50.8	38 34.8	152.38	0.80	9.993 3384	23.5	3 36 05.50
28	28	307 39 47.6	39 31.5	152.35	− 0.70	9.993 3960	+ 24.5	3 32 09.59
29	29	308 40 43.7	40 27.4	152.32	0.59	9.993 4561	25.5	3 28 13.68
30	30	309 41 39.0	41 22.7	152.29	0.47	9.993 5184	26.4	3 24 17.77
31	31	310 42 33.6	42 17.1	152.26	0.34	9.993 5828	27.2	3 20 21.86
32	32	311 43 27.4	43 10.8	152.23	− 0.20	9.993 6490	+ 28.0	3 16 25.95

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' to the mean equinox of January 0.0ᵈ of the Besselian fictitious year.

Diff. for 1 Hour,
− 9.8296′.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 03.3	14 58.7	55 09.1	− 1.49	54 52.5	− 1.28	18 17.3	+ 1.83	21.4
2	14 54.8	14 51.7	54 38.3	1.08	54 26.6	0.86	19 01.3	1.85	22.4
3	14 49.2	14 47.4	54 17.6	0.65	54 11.0	0.45	19 46.0	1.89	23.4
4	14 46.3	14 45.8	54 06.8	− 0.25	54 05.0	− 0.06	20 31.9	+ 1.94	24.4
5	14 45.9	14 46.6	54 05.4	+ 0.12	54 07.8	+ 0.28	21 19.0	1.99	25.4
6	14 47.7	14 49.4	54 12.1	0.43	54 18.2	0.57	22 07.3	2.03	26.4
7	14 51.5	14 53.9	54 25.8	+ 0.69	54 34.7	+ 0.80	22 56.4	+ 2.05	27.4
8	14 56.6	14 59.7	54 44.8	0.88	54 55.9	0.96	23 45.7	2.05	28.4
9	15 02.9	15 06.3	55 07.8	1.02	55 20.4	1.07	♂		29.4
10	15 09.9	15 13.6	55 33.6	+ 1.11	55 47.1	+ 1.15	0 34.8	+ 2.03	0.6
11	15 17.4	15 21.3	56 01.1	1.17	56 15.3	1.19	1 23.2	2.01	1.6
12	15 25.2	15 29.2	56 29.7	1.21	56 44.3	1.22	2 11.1	1.99	2.6
13	15 33.2	15 37.3	56 59.0	+ 1.23	57 13.9	+ 1.25	2 58.6	+ 1.98	3.6
14	15 41.4	15 45.5	57 29.0	1.25	57 44.1	1.26	3 46.3	2.00	4.6
15	15 49.6	15 53.8	57 59.3	1.26	58 14.4	1.26	4 34.8	2.05	5.6
16	15 57.9	16 01.9	58 29.5	+ 1.25	58 44.2	+ 1.21	5 24.9	+ 2.13	6.6
17	16 05.8	16 09.5	58 58.5	1.16	59 12.1	1.09	6 17.4	2.24	7.6
18	16 12.9	16 16.0	59 24.8	1.00	59 36.1	0.88	7 12.7	2.36	8.6
19	16 18.7	16 20.8	59 45.8	+ 0.73	59 53.6	+ 0.55	8 10.7	+ 2.46	9.6
20	16 22.3	16 23.0	59 59.0	+ 0.34	60 01.8	+ 0.12	9 10.6	2.51	10.6
21	16 23.0	16 22.1	60 01.7	− 0.14	59 58.5	− 0.40	10 11.1	2.50	11.6
22	16 20.4	16 17.8	59 52.1	− 0.66	59 42.5	− 0.93	11 10.4	+ 2.43	12.6
23	16 14.3	16 10.1	59 29.9	1.17	59 14.4	1.40	12 07.3	2.31	13.6
24	16 05.2	15 59.6	58 56.2	1.60	58 36.0	1.76	13 01.1	2.18	14.6
25	15 53.6	15 47.3	58 14.0	− 1.88	57 50.8	− 1.96	13 51.8	+ 2.06	15.6
26	15 40.8	15 34.2	57 26.9	2.00	57 02.8	2.00	14 39.8	1.96	16.6
27	15 27.8	15 21.5	56 39.0	1.95	56 15.9	1.88	15 26.0	1.90	17.6
28	15 15.5	15 09.9	55 54.0	− 1.76	55 33.6	− 1.62	16 11.1	+ 1.87	18.6
29	15 04.9	15 00.4	55 15.0	1.46	54 58.6	1.28	16 55.7	1.86	19.6
30	14 56.5	14 53.3	54 44.4	1.08	54 32.7	0.87	17 40.6	1.88	20.6
31	14 50.9	14 49.1	54 23.6	0.65	54 17.1	− 0.43	18 26.2	1.92	21.6
32	14 48.0	14 47.7	54 13.3	− 0.21	54 12.1	0.00	19 12.7	+ 1.96	22.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 1.					**FRIDAY 3.**			
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 25 47.08	+ 1.9370	S. 5 52 19.0	− 9.983	0	13 58 55.21	+ 1.9597	S. 13 02 49.8	− 7.767
1	12 27 43.28	1.9363	6 02 16.9	9.948	1	14 00 52.83	1.9610	13 10 34.1	7.708
2	12 29 39.44	1.9358	6 12 12.8	9.913	2	14 02 50.53	1.9624	13 18 14.8	7.650
3	12 31 35.58	1.9354	6 22 06.5	9.878	3	14 04 48.32	1.9639	13 25 52.1	7.592
4	12 33 31.69	1.9349	6 31 58.1	9.842	4	14 06 46.20	1.9654	13 33 25.8	7.532
5	12 35 27.77	1.9345	6 41 47.5	9.806	5	14 08 44.17	1.9669	13 40 55.9	7.472
6	12 37 23.83	1.9342	6 51 34.8	9.769	6	14 10 42.23	1.9685	13 48 22.4	7.412
7	12 39 19.87	1.9339	7 01 19.8	9.731	7	14 12 40.39	1.9701	13 55 45.3	7.351
8	12 41 15.90	1.9338	7 11 02.5	9.692	8	14 14 38.64	1.9716	14 03 04.5	7.289
9	12 43 11.92	1.9336	7 20 42.9	9.654	9	14 16 36.98	1.9732	14 10 20.0	7.227
10	12 45 07.93	1.9334	7 30 21.0	9.616	10	14 18 35.43	1.9749	14 17 31.8	7.165
11	12 47 03.93	1.9332	7 39 56.8	9.576	11	14 20 33.97	1.9765	14 24 39.8	7.102
12	12 48 59.92	1.9332	7 49 30.1	9.536	12	14 22 32.61	1.9782	14 31 44.1	7.040
13	12 50 55.92	1.9333	7 59 01.1	9.496	13	14 24 31.35	1.9799	14 38 44.6	6.976
14	12 52 51.92	1.9333	8 08 29.6	9.454	14	14 26 30.20	1.9817	14 45 41.2	6.912
15	12 54 47.92	1.9334	8 17 55.6	9.412	15	14 28 29.16	1.9835	14 52 34.0	6.847
16	12 56 43.93	1.9337	8 27 19.1	9.370	16	14 30 28.22	1.9852	14 59 22.8	6.781
17	12 58 39.96	1.9338	8 36 40.0	9.327	17	14 32 27.39	1.9870	15 06 07.7	6.716
18	13 00 35.99	1.9340	8 45 58.4	9.285	18	14 34 26.66	1.9888	15 12 48.7	6.651
19	13 02 32.04	1.9343	8 55 14.2	9.242	19	14 36 26.04	1.9907	15 19 25.8	6.584
20	13 04 28.11	1.9347	9 04 27.4	9.197	20	14 38 25.54	1.9926	15 25 58.8	6.517
21	13 06 24.20	1.9350	9 13 37.9	9.152	21	14 40 25.15	1.9944	15 32 27.8	6.449
22	13 08 20.31	1.9354	9 22 45.7	9.107	22	14 42 24.87	1.9962	15 38 52.7	6.382
23	13 10 16.45	+ 1.9358	S. 9 31 50.8	− 9.062	23	14 44 24.70	+ 1.9981	S. 15 45 13.6	− 6.313
	THURSDAY 2.					**SATURDAY 4.**			
0	13 12 12.61	+ 1.9362	S. 9 40 53.1	− 9.016	0	14 46 24.64	+ 2.0000	S. 15 51 30.3	− 6.244
1	13 14 08.80	1.9368	9 49 52.7	8.970	1	14 48 24.70	2.0020	15 57 42.9	6.175
2	13 16 05.03	1.9375	9 58 49.5	8.922	2	14 50 24.88	2.0039	16 03 51.3	6.105
3	13 18 01.30	1.9381	10 07 43.4	8.875	3	14 52 25.17	2.0059	16 09 55.5	6.035
4	13 19 57.60	1.9387	10 16 34.5	8.827	4	14 54 25.59	2.0079	16 15 55.5	5.965
5	13 21 53.95	1.9395	10 25 22.7	8.779	5	14 56 26.12	2.0098	16 21 51.3	5.894
6	13 23 50.34	1.9402	10 34 08.0	8.730	6	14 58 26.77	2.0118	16 27 42.8	5.822
7	13 25 46.77	1.9409	10 42 50.3	8.680	7	15 00 27.54	2.0138	16 33 30.0	5.750
8	13 27 43.25	1.9417	10 51 29.6	8.630	8	15 02 28.43	2.0158	16 39 12.8	5.677
9	13 29 39.78	1.9426	11 00 05.9	8.580	9	15 04 29.44	2.0179	16 44 51.2	5.604
10	13 31 36.36	1.9435	11 08 39.2	8.529	10	15 06 30.58	2.0199	16 50 25.3	5.532
11	13 33 33.00	1.9444	11 17 09.4	8.477	11	15 08 31.83	2.0219	16 55 55.0	5.458
12	13 35 29.69	1.9453	11 25 36.5	8.426	12	15 10 33.21	2.0240	17 01 20.2	5.383
13	13 37 26.44	1.9464	11 34 00.5	8.373	13	15 12 34.71	2.0260	17 06 41.0	5.308
14	13 39 23.26	1.9475	11 42 21.3	8.321	14	15 14 36.33	2.0281	17 11 57.2	5.232
15	13 41 20.14	1.9485	11 50 39.0	8.267	15	15 16 38.08	2.0302	17 17 08.9	5.157
16	13 43 17.08	1.9496	11 58 53.4	8.213	16	15 18 39.95	2.0322	17 22 16.1	5.082
17	13 45 14.09	1.9507	12 07 04.6	8.159	17	15 20 41.94	2.0342	17 27 18.7	5.005
18	13 47 11.17	1.9519	12 15 12.5	8.104	18	15 22 44.06	2.0363	17 32 16.7	4.928
19	13 49 08.32	1.9531	12 23 17.1	8.049	19	15 24 46.30	2.0384	17 37 10.1	4.851
20	13 51 05.54	1.9543	12 31 18.4	7.994	20	15 26 48.67	2.0405	17 41 58.8	4.772
21	13 53 02.84	1.9557	12 39 16.4	7.937	21	15 28 51.16	2.0425	17 46 42.8	4.694
22	13 55 00.22	1.9569	12 47 11.0	7.881	22	15 30 53.77	2.0446	17 51 22.1	4.616
23	13 56 57.67	1.9582	12 55 02.1	7.824	23	15 32 56.51	2.0467	17 55 56.7	4.537
24	13 58 55.21	+ 1.9597	S. 13 02 49.8	− 7.767	24	15 34 59.38	+ 2.0488	S. 18 00 26.5	− 4.457

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	15 34 59.38	+ 2.0488	S.18 00 26.5	− 4.457
1	15 37 02.37	2.0508	18 04 51.6	4.377
2	15 39 05.48	2.0528	18 09 11.8	4.297
3	15 41 08.71	2.0549	18 13 27.2	4.216
4	15 43 12.07	2.0570	18 17 37.7	4.135
5	15 45 15.55	2.0590	18 21 43.4	4.053
6	15 47 19.15	2.0610	18 25 44.1	3.971
7	15 49 22.87	2.0631	18 29 39.9	3.889
8	15 51 26.72	2.0652	18 33 30.8	3.807
9	15 53 30.69	2.0672	18 37 16.7	3.723
10	15 55 34.78	2.0691	18 40 57.6	3.639
11	15 57 38.98	2.0711	18 44 33.4	3.555
12	15 59 43.31	2.0732	18 48 04.2	3.471
13	16 01 47.76	2.0752	18 51 29.9	3.387
14	16 03 52.33	2.0771	18 54 50.6	3.302
15	16 05 57.01	2.0790	18 58 06.1	3.216
16	16 08 01.81	2.0810	19 01 16.5	3.130
17	16 10 06.73	2.0829	19 04 21.7	3.043
18	16 12 11.76	2.0847	19 07 21.7	2.957
19	16 14 16.90	2.0867	19 10 16.5	2.870
20	16 16 22.16	2.0886	19 13 06.1	2.783
21	16 18 27.53	2.0904	19 15 50.5	2.696
22	16 20 33.01	2.0922	19 18 29.6	2.607
23	16 22 38.60	+ 2.0940	S.19 21 03.3	− 2.518

MONDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
0	16 24 44.29	+ 2.0958	S.19 23 31.8	− 2.431
1	16 26 50.10	2.0977	19 25 55.0	2.342
2	16 28 56.01	2.0993	19 28 12.8	2.252
3	16 31 02.02	2.1011	19 30 25.2	2.162
4	16 33 08.14	2.1028	19 32 32.2	2.072
5	16 35 14.36	2.1046	19 34 33.8	1.982
6	16 37 20.69	2.1062	19 36 30.0	1.892
7	16 39 27.11	2.1078	19 38 20.8	1.801
8	16 41 33.63	2.1095	19 40 06.1	1.710
9	16 43 40.25	2.1111	19 41 46.0	1.618
10	16 45 46.96	2.1127	19 43 20.3	1.526
11	16 47 53.77	2.1142	19 44 49.1	1.434
12	16 50 00.66	2.1157	19 46 12.4	1.342
13	16 52 07.65	2.1172	19 47 30.2	1.250
14	16 54 14.73	2.1187	19 48 42.4	1.157
15	16 56 21.89	2.1201	19 49 49.1	1.065
16	16 58 29.14	2.1215	19 50 50.2	0.972
17	17 00 36.47	2.1229	19 51 45.7	0.878
18	17 02 43.89	2.1243	19 52 35.6	0.784
19	17 04 51.39	2.1256	19 53 19.8	0.691
20	17 06 58.96	2.1268	19 53 58.5	0.597
21	17 09 06.61	2.1282	19 54 31.5	0.502
22	17 11 14.34	2.1294	19 54 58.8	0.407
23	17 13 22.14	2.1306	19 55 20.4	0.313
24	17 15 30.01	+ 2.1317	S.19 55 36.4	− 0.217

TUESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	17 15 30.01	+ 2.1317	S.19 55 36.4	− 0.217
1	17 17 37.95	2.1329	19 55 46.7	0.124
2	17 19 45.96	2.1341	19 55 51.3	− 0.029
3	17 21 54.04	2.1352	19 55 50.2	+ 0.067
4	17 24 02.18	2.1362	19 55 43.3	0.162
5	17 26 10.38	2.1371	19 55 30.8	0.257
6	17 28 18.63	2.1381	19 55 12.5	0.352
7	17 30 26.95	2.1392	19 54 48.5	0.448
8	17 32 35.33	2.1400	19 54 18.7	0.544
9	17 34 43.75	2.1408	19 53 43.2	0.640
10	17 36 52.23	2.1417	19 53 01.9	0.736
11	17 39 00.76	2.1425	19 52 14.9	0.832
12	17 41 09.33	2.1433	19 51 22.1	0.928
13	17 43 17.95	2.1441	19 50 23.5	1.024
14	17 45 26.62	2.1447	19 49 19.2	1.120
15	17 47 35.32	2.1454	19 48 09.1	1.217
16	17 49 44.07	2.1461	19 46 53.2	1.313
17	17 51 52.85	2.1466	19 45 31.5	1.410
18	17 54 01.66	2.1472	19 44 04.0	1.506
19	17 56 10.51	2.1477	19 42 30.8	1.602
20	17 58 19.39	2.1482	19 40 51.8	1.698
21	18 00 28.30	2.1487	19 39 07.0	1.794
22	18 02 37.23	2.1491	19 37 16.5	1.890
23	18 04 46.19	+ 2.1495	S.19 35 20.2	+ 1.987

WEDNESDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
0	18 06 55.17	+ 2.1498	S.19 33 18.1	+ 2.083
1	18 09 04.17	2.1502	19 31 10.2	2.179
2	18 11 13.19	2.1505	19 28 56.6	2.275
3	18 13 22.23	2.1507	19 26 37.2	2.372
4	18 15 31.28	2.1509	19 24 12.0	2.467
5	18 17 40.34	2.1511	19 21 41.1	2.563
6	18 19 49.41	2.1512	19 19 04.4	2.659
7	18 21 58.49	2.1513	19 16 22.0	2.755
8	18 24 07.57	2.1514	19 13 33.8	2.851
9	18 26 16.66	2.1515	19 10 39.9	2.946
10	18 28 25.75	2.1514	19 07 40.3	3.042
11	18 30 34.83	2.1514	19 04 34.9	3.137
12	18 32 43.92	2.1514	19 01 23.9	3.231
13	18 34 53.00	2.1513	18 58 07.2	3.326
14	18 37 02.08	2.1512	18 54 44.8	3.421
15	18 39 11.15	2.1511	18 51 16.7	3.516
16	18 41 20.21	2.1509	18 47 42.9	3.610
17	18 43 29.26	2.1507	18 44 03.5	3.703
18	18 45 38.29	2.1504	18 40 18.5	3.797
19	18 47 47.31	2.1502	18 36 27.8	3.892
20	18 49 56.31	2.1498	18 32 31.5	3.985
21	18 52 05.29	2.1495	18 28 29.6	4.077
22	18 54 14.25	2.1492	18 24 22.2	4.170
23	18 56 23.19	2.1488	18 20 09.2	4.262
24	18 58 32.10	+ 2.1483	S.18 15 50.7	+ 4.355

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″

THURSDAY 9. / SATURDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 58 32.10	+ 2.1483	S. 18 15 50.7	+ 4.355	0	20 40 46.71	+ 2.1072	S. 13 07 41.0	+ 8.299
1	19 00 40.99	2.1479	18 11 26.6	4.447	1	20 42 53.11	2.1062	12 59 21.0	8.368
2	19 02 49.85	2.1473	18 06 57.1	4.538	2	20 44 59.45	2.1052	12 50 56.8	8.437
3	19 04 58.67	2.1468	18 02 22.0	4.631	3	20 47 05.73	2.1042	12 42 28.6	8.504
4	19 07 07.47	2.1464	17 57 41.4	4.722	4	20 49 11.95	2.1032	12 33 56.3	8.572
5	19 09 16.24	2.1458	17 52 55.4	4.812	5	20 51 18.11	2.1022	12 25 20.0	8.637
6	19 11 24.97	2.1452	17 48 04.0	4.902	6	20 53 24.21	2.1012	12 16 39.8	8.702
7	19 13 33.66	2.1446	17 43 07.1	4.993	7	20 55 30.25	2.1002	12 07 55.7	8.767
8	19 15 42.32	2.1440	17 38 04.8	5.083	8	20 57 36.24	2.0994	11 59 07.7	8.832
9	19 17 50.94	2.1433	17 32 57.1	5.172	9	20 59 42.18	2.0985	11 50 15.8	8.896
10	19 19 59.52	2.1427	17 27 44.1	5.261	10	21 01 48.06	2.0975	11 41 20.2	8.958
11	19 22 08.06	2.1420	17 22 25.8	5.350	11	21 03 53.88	2.0965	11 32 20.8	9.021
12	19 24 16.56	2.1412	17 17 02.1	5.439	12	21 05 59.64	2.0957	11 23 17.7	9.082
13	19 26 25.01	2.1405	17 11 33.1	5.527	13	21 08 05.36	2.0948	11 14 11.0	9.142
14	19 28 33.42	2.1398	17 05 58.9	5.614	14	21 10 11.02	2.0939	11 05 00.6	9.203
15	19 30 41.79	2.1391	17 00 19.4	5.702	15	21 12 16.63	2.0932	10 55 46.6	9.262
16	19 32 50.11	2.1382	16 54 34.7	5.788	16	21 14 22.20	2.0923	10 46 29.1	9.320
17	19 34 58.37	2.1373	16 48 44.8	5.875	17	21 16 27.71	2.0915	10 37 08.2	9.377
18	19 37 06.59	2.1366	16 42 49.7	5.961	18	21 18 33.18	2.0907	10 27 43.8	9.435
19	19 39 14.76	2.1357	16 36 49.5	6.046	19	21 20 38.60	2.0900	10 18 16.0	9.492
20	19 41 22.88	2.1349	16 30 44.2	6.131	20	21 22 43.98	2.0892	10 08 44.8	9.547
21	19 43 30.95	2.1340	16 24 33.8	6.216	21	21 24 49.31	2.0884	9 59 10.3	9.602
22	19 45 38.96	2.1331	16 18 18.3	6.300	22	21 26 54.59	2.0877	9 49 32.5	9.656
23	19 47 46.92	+ 2.1322	S. 16 11 57.8	+ 6.383	23	21 28 59.84	+ 2.0871	S. 9 39 51.6	+ 9.709

FRIDAY 10. / SUNDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 49 54.82	+ 2.1312	S. 16 05 32.3	+ 6.467	0	21 31 05.04	+ 2.0864	S. 9 30 07.4	+ 9.762
1	19 52 02.67	2.1303	15 59 01.8	6.549	1	21 33 10.21	2.0858	9 20 20.1	9.814
2	19 54 10.46	2.1293	15 52 26.4	6.632	2	21 35 15.34	2.0852	9 10 29.7	9.865
3	19 56 18.19	2.1284	15 45 46.0	6.713	3	21 37 20.43	2.0846	9 00 36.3	9.915
4	19 58 25.87	2.1275	15 39 00.8	6.794	4	21 39 25.49	2.0841	8 50 39.9	9.965
5	20 00 33.49	2.1265	15 32 10.7	6.875	5	21 41 30.52	2.0836	8 40 40.5	10.014
6	20 02 41.05	2.1255	15 25 15.8	6.955	6	21 43 35.52	2.0831	8 30 38.2	10.062
7	20 04 48.55	2.1245	15 18 16.1	7.034	7	21 45 40.49	2.0826	8 20 33.1	10.109
8	20 06 55.99	2.1235	15 11 11.7	7.113	8	21 47 45.43	2.0821	8 10 25.1	10.156
9	20 09 03.37	2.1225	15 04 02.5	7.192	9	21 49 50.34	2.0817	8 00 14.4	10.201
10	20 11 10.69	2.1215	14 56 48.6	7.270	10	21 51 55.23	2.0813	7 50 01.0	10.246
11	20 13 17.95	2.1205	14 49 30.1	7.347	11	21 54 00.10	2.0810	7 39 44.9	10.290
12	20 15 25.15	2.1195	14 42 06.9	7.424	12	21 56 04.95	2.0807	7 29 26.2	10.333
13	20 17 32.29	2.1184	14 34 39.2	7.500	13	21 58 09.78	2.0803	7 19 04.9	10.376
14	20 19 39.36	2.1173	14 27 06.9	7.576	14	22 00 14.59	2.0801	7 08 41.1	10.417
15	20 21 46.37	2.1163	14 19 30.1	7.651	15	22 02 19.39	2.0798	6 58 14.8	10.458
16	20 23 53.32	2.1153	14 11 48.8	7.726	16	22 04 24.17	2.0796	6 47 46.1	10.498
17	20 26 00.21	2.1143	14 04 03.0	7.800	17	22 06 28.94	2.0795	6 37 15.0	10.537
18	20 28 07.04	2.1132	13 56 12.8	7.873	18	22 08 33.71	2.0794	6 26 41.6	10.576
19	20 30 13.80	2.1122	13 48 18.2	7.946	19	22 10 38.47	2.0793	6 16 05.9	10.613
20	20 32 20.51	2.1112	13 40 19.3	8.017	20	22 12 43.23	2.0792	6 05 28.0	10.650
21	20 34 27.15	2.1102	13 32 16.1	8.089	21	22 14 47.98	2.0792	5 54 47.9	10.686
22	20 36 33.73	2.1092	13 24 08.6	8.160	22	22 16 52.73	2.0792	5 44 05.7	10.721
23	20 38 40.25	2.1082	13 15 56.9	8.230	23	22 18 57.48	2.0792	5 33 21.4	10.756
24	20 40 46.71	+ 2.1072	S. 13 07 41.0	+ 8.299	24	22 21 02.23	+ 2.0793	S. 5 22 35.0	+ 10.789

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 13.					**WEDNESDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 21 02.23	+ 2.0793	S. 5 22 35.0	+10.789	0	0 01 45.67	+ 2.1353	N. 3 37 00.4	+11.339
1	22 23 07.00	2.0795	5 11 46.7	10.822	1	0 03 53.86	2.1377	3 48 20.4	11.327
2	22 25 11.77	2.0796	5 00 56.4	10.853	2	0 06 02.20	2.1402	3 59 39.7	11.315
3	22 27 16.55	2.0798	4 50 04.3	10.884	3	0 08 10.69	2.1427	4 10 58.2	11.301
4	22 29 21.35	2.0801	4 39 10.3	10.914	4	0 10 19.32	2.1451	4 22 15.8	11.286
5	22 31 26.16	2.0803	4 28 14.6	10.943	5	0 12 28.10	2.1477	4 33 32.5	11.270
6	22 33 30.99	2.0807	4 17 17.1	10.972	6	0 14 37.04	2.1502	4 44 48.2	11.253
7	22 35 35.84	2.0811	4 06 18.0	10.998	7	0 16 46.13	2.1528	4 56 02.9	11.235
8	22 37 40.72	2.0815	3 55 17.3	11.025	8	0 18 55.38	2.1556	5 07 16.4	11.216
9	22 39 45.62	2.0819	3 44 15.0	11.051	9	0 21 04.80	2.1584	5 18 28.8	11.196
10	22 41 50.55	2.0824	3 33 11.2	11.076	10	0 23 14.39	2.1612	5 29 39.9	11.174
11	22 43 55.51	2.0829	3 22 05.9	11.100	11	0 25 24.14	2.1640	5 40 49.7	11.152
12	22 46 00.50	2.0835	3 10 59.2	11.122	12	0 27 34.07	2.1669	5 51 58.2	11.129
13	22 48 05.53	2.0842	2 59 51.2	11.145	13	0 29 44.17	2.1698	6 03 05.2	11.104
14	22 50 10.60	2.0848	2 48 41.8	11.167	14	0 31 54.45	2.1728	6 14 10.7	11.079
15	22 52 15.71	2.0855	2 37 31.2	11.187	15	0 34 04.91	2.1758	6 25 14.7	11.053
16	22 54 20.86	2.0862	2 26 19.4	11.206	16	0 36 15.55	2.1789	6 36 17.1	11.025
17	22 56 26.05	2.0870	2 15 06.5	11.224	17	0 38 26.38	2.1821	6 47 17.7	10.996
18	22 58 31.30	2.0879	2 03 52.5	11.242	18	0 40 37.40	2.1852	6 58 16.6	10.967
19	23 00 36.60	2.0887	1 52 37.4	11.260	19	0 42 48.61	2.1884	7 09 13.7	10.936
20	23 02 41.95	2.0897	1 41 21.3	11.276	20	0 45 00.01	2.1917	7 20 08.9	10.904
21	23 04 47.37	2.0907	1 30 04.3	11.290	21	0 47 11.61	2.1950	7 31 02.2	10.871
22	23 06 52.84	2.0917	1 18 46.5	11.304	22	0 49 23.41	2.1983	7 41 53.4	10.837
23	23 08 58.37	+ 2.0927	S. 1 07 27.8	+11.317	23	0 51 35.41	+ 2.2017	N. 7 52 42.6	+10.802
	TUESDAY 14.					**THURSDAY 16.**			
0	23 11 03.97	+ 2.0939	S. 0 56 08.4	+11.329	0	0 53 47.62	+ 2.2052	N. 8 03 29.6	+10.765
1	23 13 09.64	2.0951	0 44 48.3	11.341	1	0 56 00.04	2.2087	8 14 14.4	10.727
2	23 15 15.38	2.0963	0 33 27.5	11.352	2	0 58 12.66	2.2122	8 24 56.9	10.689
3	23 17 21.19	2.0976	0 22 06.1	11.362	3	1 00 25.50	2.2157	8 35 37.1	10.649
4	23 19 27.09	2.0989	S. 0 10 44.1	11.370	4	1 02 38.55	2.2193	8 46 14.8	10.608
5	23 21 33.06	2.1002	N. 0 00 38.3	11.377	5	1 04 51.82	2.2230	8 56 50.1	10.567
6	23 23 39.11	2.1017	0 12 01.1	11.383	6	1 07 05.31	2.2267	9 07 22.8	10.523
7	23 25 45.26	2.1032	0 23 24.3	11.390	7	1 09 19.03	2.2305	9 17 52.9	10.479
8	23 27 51.49	2.1047	0 34 47.9	11.395	8	1 11 32.97	2.2342	9 28 20.3	10.434
9	23 29 57.82	2.1062	0 46 11.7	11.398	9	1 13 47.13	2.2380	9 38 45.0	10.387
10	23 32 04.23	2.1077	0 57 35.7	11.401	10	1 16 01.53	2.2418	9 49 06.8	10.340
11	23 34 10.74	2.1094	1 08 59.8	11.402	11	1 18 16.15	2.2457	9 59 25.8	10.292
12	23 36 17.36	2.1112	1 20 24.0	11.404	12	1 20 31.01	2.2497	10 09 41.8	10.241
13	23 38 24.08	2.1128	1 31 48.3	11.404	13	1 22 46.11	2.2536	10 19 54.7	10.189
14	23 40 30.90	2.1146	1 43 12.5	11.403	14	1 25 01.44	2.2575	10 30 04.5	10.137
15	23 42 37.83	2.1165	1 54 36.7	11.402	15	1 27 17.01	2.2616	10 40 11.2	10.084
16	23 44 44.88	2.1184	2 06 00.7	11.398	16	1 29 32.83	2.2657	10 50 14.6	10.029
17	23 46 52.04	2.1204	2 17 24.5	11.395	17	1 31 48.89	2.2697	11 00 14.7	9.973
18	23 48 59.33	2.1224	2 28 48.1	11.390	18	1 34 05.19	2.2737	11 10 11.4	9.916
19	23 51 06.73	2.1244	2 40 11.3	11.383	19	1 36 21.74	2.2779	11 20 04.6	9.857
20	23 53 14.26	2.1265	2 51 34.1	11.377	20	1 38 38.54	2.2821	11 29 54.3	9.798
21	23 55 21.91	2.1287	3 02 56.5	11.369	21	1 40 55.59	2.2863	11 39 40.4	9.737
22	23 57 29.70	2.1309	3 14 18.4	11.360	22	1 43 12.90	2.2906	11 49 22.8	9.676
23	23 59 37.62	2.1331	3 25 39.7	11.350	23	1 45 30.46	2.2947	11 59 01.5	9.613
24	0 01 45.67	+ 2.1353	N. 3 37 00.4	+11.339	24	1 47 48.27	+ 2.2990	N. 12 08 36.4	+ 9.549

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 17.					**SUNDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 47 48.27	+2.2990	N.12 08 36.4	+9.549	0	3 43 12.33	+2.5043	N.18 10 30.6	+5.091
1	1 50 06.34	2.3033	12 18 07.4	9.484	1	3 45 42.69	2.5078	18 15 32.5	4.971
2	1 52 24.67	2.3077	12 27 34.5	9.417	2	3 48 13.27	2.5114	18 20 27.1	4.850
3	1 54 43.26	2.3120	12 36 57.5	9.349	3	3 50 44.06	2.5148	18 25 14.5	4.729
4	1 57 02.11	2.3163	12 46 16.4	9.280	4	3 53 15.05	2.5182	18 29 54.6	4.607
5	1 59 21.22	2.3207	12 55 31.1	9.210	5	3 55 46.25	2.5216	18 34 27.4	4.484
6	2 01 40.59	2.3251	13 04 41.6	9.139	6	3 58 17.64	2.5248	18 38 52.7	4.360
7	2 04 00.23	2.3295	13 13 47.8	9.067	7	4 00 49.23	2.5281	18 43 10.6	4.236
8	2 06 20.13	2.3339	13 22 49.6	8.993	8	4 03 21.01	2.5312	18 47 21.0	4.111
9	2 08 40.30	. 2.3383	13 31 47.0	8.918	9	4 05 52.98	2.5343	18 51 23.9	3.984
10	2 11 00.73	2.3427	13 40 39.8	8.842	10	4 08 25.13	2.5372	18 55 19.1	3.857
11	2 13 21.43	2.3473	13 49 28.0	8.764	11	4 10 57.45	2.5402	18 59 06.7	3.729
12	2 15 42.41	2.3518	13 58 11.5	8.686	12	4 13 29.95	2.5431	19 02 46.6	3.600
13	2 18 03.65	2.3562	14 06 50.3	8.606	13	4 16 02.62	2.5458	19 06 18.7	3.471
14	2 20 25.15	2.3607	14 15 24.2	8.525	14	4 18 35.45	2.5485	19 09 43.1	3.341
15	2 22 46.93	2.3652	14 23 53.3	8.443	15	4 21 08.44	2.5512	19 12 59.6	3.210
16	2 25 08.97	2.3697	14 32 17.4	8.359	16	4 23 41.59	2.5537	19 16 08.3	3.079
17	2 27 31.29	2.3742	14 40 36.4	8.274	17	4 26 14.88	2.5561	19 19 09.1	2.947
18	2 29 53.87	2.3786	14 48 50.3	8.189	18	4 28 48.32	2.5585	19 22 02.0	2.815
19	2 32 16.72	2.3831	14 56 59.1	8.102	19	4 31 21.90	2.5607	19 24 46.9	2.682
20	2 34 39.84	2.3875	15 05 02.6	8.014	20	4 33 55.61	2.5629	19 27 23.8	2.547
21	2 37 03.22	2.3920	15 13 00.8	7.925	21	4 36 29.45	2.5650	19 29 52.6	2.413
22	2 39 26.88	2.3965	15 20 53.6	7.835	22	4 39 03.41	2.5669	19 32 13.4	2.279
23	2 41 50.80	+2.4009	N.15 28 41.0	+7.743	23	4 41 37.48	+2.5688	N.19 34 26.1	+2.144
	SATURDAY 18.					**MONDAY 20.**			
0	2 44 14.99	+2.4054	N.15 36 22.8	+7.650	0	4 44 11.67	+2.5707	N.19 36 30.7	+2.008
1	2 46 39.45	2.4098	15 43 59.0	7.557	1	4 46 45.96	2.5723	19 38 27.1	1.872
2	2 49 04.17	2.4142	15 51 29.6	7.462	2	4 49 20.35	2.5740	19 40 15.4	1.736
3	2 51 29.16	2.4187	15 58 54.4	7.365	3	4 51 54.84	2.5755	19 41 55.4	1.598
4	2 53 54.41	2.4231	16 06 13.4	7.267	4	4 54 29.41	2.5769	19 43 27.2	1.462
5	2 56 19.93	2.4274	16 13 26.5	7.169	5	4 57 04.07	2.5782	19 44 50.8	1.324
6	2 58 45.70	2.4318	16 20 33.7	7.069	6	4 59 38.80	2.5794	19 46 06.1	1.187
7	3 01 11.74	2.4362	16 27 34.8	6.968	7	5 02 13.60	2.5805	19 47 13.2	1.048
8	3 03 38.04	2.4404	16 34 29.9	6.867	8	5 04 48.46	2.5815	19 48 11.9	0.909
9	3 06 04.59	2.4447	16 41 18.8	6.763	9	5 07 23.38	2.5825	19 49 02.3	0.771
10	3 08 31.40	2.4489	16 48 01.5	6.659	10	5 09 58.36	2.5833	19 49 44.4	0.632
11	3 10 58.46	2.4531	16 54 37.9	6.554	11	5 12 33.38	2.5839	19 50 18.2	0.493
12	3 13 25.77	2.4572	17 01 08.0	6.448	12	5 15 08.43	2.5845	19 50 43.6	0.354
13	3 15 53.33	2.4614	17 07 31.7	6.341	13	5 17 43.52	2.5851	19 51 00.7	0.215
14	3 18 21.14	2.4656	17 13 48.9	6.232	14	5 20 18.64	2.5855	19 51 09.4	+0.075
15	3 20 49.20	2.4697	17 19 59.5	6.122	15	5 22 53.78	2.5857	19 51 09.7	−0.064
16	3 23 17.50	2.4737	17 26 03.5	6.012	16	5 25 28.93	2.5859	19 51 01.7	0.203
17	3 25 46.04	2.4777	17 32 00.9	5.900	17	5 28 04.09	2.5860	19 50 45.3	0.342
18	3 28 14.82	2.4816	17 37 51.5	5.787	18	5 30 39.25	2.5859	19 50 20.6	0.482
19	3 30 43.83	2.4855	17 43 35.3	5.673	19	5 33 14.40	2.5857	19 49 47.4	0.622
20	3 33 13.08	2.4893	17 49 12.3	5.559	20	5 35 49.54	2.5856	19 49 05.9	0.761
21	3 35 42.55	2.4931	17 54 42.4	5.443	21	5 38 24.67	2.5853	19 48 16.1	0.900
22	3 38 12.25	2.4969	18 00 05.5	5.327	22	5 40 59.78	2.5848	19 47 17.9	1.039
23	3 40 42.18	2.5007	18 05 21.6	5.209	23	5 43 34.85	2.5842	19 46 11.4	1.177
24	3 43 12.33	+2.5043	N.18 10 30.6	+5.091	24	5 46 09.89	+2.5836	N.19 44 56.6	−1.317

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.

TUESDAY 21. / THURSDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 46 09.89	+ 2.5836	N.19 44 56.6	− 1.317	0	7 47 34.25	+ 2.4439	N.16 12 11.5	− 7.231
1	5 48 44.88	2.5828	19 43 33.4	1.455	1	7 50 00.75	2.4393	16 04 54.7	7.329
2	5 51 19.82	2.5819	19 42 02.0	1.592	2	7 52 26.97	2.4347	15 57 32.0	7.427
3	5 53 54.71	2.5810	19 40 22.3	1.731	3	7 54 52.91	2.4300	15 50 03.4	7.524
4	5 56 29.54	2.5799	19 38 34.3	1.868	4	7 57 18.57	2.4253	15 42 29.1	7.619
5	5 59 04.29	2.5786	19 36 38.1	2.006	5	7 59 43.95	2.4207	15 34 49.1	7.713
6	6 01 38.97	2.5773	19 34 33.6	2.143	6	8 02 09.05	2.4160	15 27 03.5	7.806
7	6 04 13.57	2.5759	19 32 20.9	2.279	7	8 04 33.87	2.4112	15 19 12.4	7.897
8	6 06 48.08	2.5744	19 30 00.1	2.415	8	8 06 58.39	2.4063	15 11 15.8	7.987
9	6 09 22.50	2.5728	19 27 31.1	2.551	9	8 09 22.63	2.4015	15 03 13.9	8.076
10	6 11 56.82	2.5711	19 24 54.0	2.686	10	8 11 46.57	2.3966	14 55 06.7	8.163
11	6 14 31.03	2.5692	19 22 08.8	2.820	11	8 14 10.22	2.3917	14 46 54.3	8.250
12	6 17 05.13	2.5674	19 19 15.6	2.954	12	8 16 33.58	2.3869	14 38 36.7	8.335
13	6 19 39.12	2.5654	19 16 14.3	3.088	13	8 18 56.65	2.3820	14 30 14.1	8.418
14	6 22 12.98	2.5633	19 13 05.0	3.221	14	8 21 19.42	2.3770	14 21 46.5	8.500
15	6 24 46.71	2.5611	19 09 47.8	3.353	15	8 23 41.89	2.3721	14 13 14.1	8.581
16	6 27 20.31	2.5587	19 06 22.6	3.485	16	8 26 04.07	2.3672	14 04 36.8	8.661
17	6 29 53.76	2.5563	19 02 49.6	3.616	17	8 28 25.95	2.3622	13 55 54.8	8.739
18	6 32 27.07	2.5539	18 59 08.7	3.747	18	8 30 47.53	2.3572	13 47 08.1	8.816
19	6 35 00.23	2.5513	18 55 20.0	3.876	19	8 33 08.81	2.3522	13 38 16.9	8.891
20	6 37 33.23	2.5487	18 51 23.6	4.004	20	8 35 29.79	2.3472	13 29 21.2	8.965
21	6 40 06.07	2.5460	18 47 19.5	4.132	21	8 37 50.48	2.3422	13 20 21.1	9.037
22	6 42 38.75	2.5432	18 43 07.7	4.261	22	8 40 10.86	2.3372	13 11 16.7	9.109
23	6 45 11.25	+ 2.5402	N.18 38 48.2	− 4.387	23	8 42 30.95	+ 2.3322	N.13 02 08.0	− 9.179

WEDNESDAY 22. / FRIDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 47 43.57	+ 2.5371	N.18 34 21.2	− 4.512	0	8 44 50.73	+ 2.3272	N.12 52 55.2	− 9.247
1	6 50 15.70	2.5340	18 29 46.7	4.637	1	8 47 10.21	2.3222	12 43 38.3	9.315
2	6 52 47.65	2.5309	18 25 04.7	4.762	2	8 49 29.39	2.3172	12 34 17.4	9.381
3	6 55 19.41	2.5277	18 20 15.3	4.884	3	8 51 48.28	2.3122	12 24 52.6	9.446
4	6 57 50.97	2.5243	18 15 18.6	5.007	4	8 54 06.86	2.3072	12 15 23.9	9.509
5	7 00 22.32	2.5208	18 10 14.5	5.128	5	8 56 25.14	2.3022	12 05 51.5	9.571
6	7 02 53.47	2.5174	18 05 03.2	5.248	6	8 58 43.12	2.2972	11 56 15.4	9.632
7	7 05 24.41	2.5138	17 59 44.7	5.367	7	9 01 00.81	2.2923	11 46 35.7	9.692
8	7 07 55.13	2.5102	17 54 19.1	5.486	8	9 03 18.20	2.2873	11 36 52.4	9.750
9	7 10 25.63	2.5065	17 48 46.4	5.603	9	9 05 35.29	2.2823	11 27 05.7	9.806
10	7 12 55.91	2.5028	17 43 06.7	5.720	10	9 07 52.08	2.2774	11 17 15.7	9.861
11	7 15 25.97	2.4990	17 37 20.0	5.835	11	9 10 08.58	2.2725	11 07 22.4	9.915
12	7 17 55.79	2.4950	17 31 26.5	5.948	12	9 12 24.78	2.2676	10 57 25.9	9.967
13	7 20 25.37	2.4911	17 25 26.2	6.062	13	9 14 40.69	2.2627	10 47 26.3	10.019
14	7 22 54.72	2.4871	17 19 19.1	6.174	14	9 16 56.31	2.2578	10 37 23.6	10.069
15	7 25 23.82	2.4829	17 13 05.3	6.285	15	9 19 11.63	2.2530	10 27 18.0	10.117
16	7 27 52.67	2.4788	17 06 44.9	6.394	16	9 21 26.67	2.2482	10 17 09.5	10.165
17	7 30 21.28	2.4747	17 00 18.0	6.503	17	9 23 41.41	2.2433	10 06 58.2	10.211
18	7 32 49.63	2.4703	16 53 44.5	6.611	18	9 25 55.87	2.2386	9 56 44.2	10.256
19	7 35 17.72	2.4661	16 47 04.7	6.717	19	9 28 10.04	2.2338	9 46 27.5	10.300
20	7 37 45.56	2.4617	16 40 18.5	6.822	20	9 30 23.93	2.2292	9 36 08.2	10.342
21	7 40 13.13	2.4573	16 33 26.0	6.927	21	9 32 37.54	2.2244	9 25 46.4	10.383
22	7 42 40.44	2.4529	16 26 27.3	7.030	22	9 34 50.86	2.2197	9 15 22.2	10.423
23	7 45 07.48	2.4484	16 19 22.4	7.132	23	9 37 03.90	2.2150	9 04 55.6	10.462
24	7 47 34.25	+ 2.4439	N.16 12 11.5	− 7.231	24	9 39 16.66	+ 2.2104	N. 8 54 26.8	− 10.498

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
	SATURDAY 25.		MONDAY 27.						

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 39 16.66	+ 2.2104	N. 8 54 26.8	− 10.498	0	11 20 46.10	+ 2.0351	N. 0 09 25.6	− 10.978
1	9 41 29.15	2.2058	8 43 55.8	10.534	1	11 22 48.13	2.0326	S. 0 01 32.7	10.955
2	9 43 41.36	2.2012	8 33 22.7	10.569	2	11 24 50.01	2.0301	0 12 30.2	10.951
3	9 45 53.30	2.1967	8 22 47.5	10.603	3	11 26 51.74	2.0277	0 23 26.8	10.936
4	9 48 04.97	2.1922	8 12 10.3	10.635	4	11 28 53.33	2.0253	0 34 22.5	10.920
5	9 50 16.37	2.1877	8 01 31.3	10.666	5	11 30 54.78	2.0230	0 45 17.2	10.902
6	9 52 27.50	2.1833	7 50 50.4	10.697	6	11 32 56.09	2.0207	0 56 10.8	10.885
7	9 54 38.37	2.1790	7 40 07.7	10.725	7	11 34 57.27	2.0185	1 07 03.4	10.867
8	9 56 48.98	2.1747	7 29 23.4	10.753	8	11 36 58.31	2.0163	1 17 54.9	10.848
9	9 58 59.33	2.1703	7 18 37.4	10.779	9	11 38 59.22	2.0142	1 28 45.2	10.827
10	10 01 09.42	2.1660	7 07 49.9	10.803	10	11 41 00.01	2.0121	1 39 34.2	10.807
11	10 03 19.25	2.1617	6 57 01.0	10.827	11	11 43 00.67	2.0100	1 50 22.0	10.786
12	10 05 28.83	2.1576	6 46 10.6	10.851	12	11 45 01.21	2.0081	2 01 08.5	10.763
13	10 07 38.16	2.1533	6 35 18.9	10.872	13	11 47 01.64	2.0062	2 11 53.6	10.741
14	10 09 47.23	2.1492	6 24 26.0	10.892	14	11 49 01.95	2.0042	2 22 37.4	10.717
15	10 11 56.06	2.1452	6 13 31.9	10.912	15	11 51 02.15	2.0024	2 33 19.7	10.692
16	10 14 04.65	2.1411	6 02 36.6	10.931	16	11 53 02.24	2.0007	2 44 00.5	10.667
17	10 16 12.99	2.1371	5 51 40.2	10.947	17	11 55 02.23	1.9989	2 54 39.8	10.642
18	10 18 21.10	2.1332	5 40 42.9	10.963	18	11 57 02.11	1.9972	3 05 17.6	10.616
19	10 20 28.97	2.1292	5 29 44.6	10.978	19	11 59 01.89	1.9956	3 15 53.7	10.588
20	10 22 36.60	2.1252	5 18 45.5	10.992	20	12 01 01.58	1.9940	3 26 28.2	10.561
21	10 24 44.00	2.1214	5 07 45.6	11.005	21	12 03 01.17	1.9924	3 37 01.0	10.532
22	10 26 51.17	2.1176	4 56 44.9	11.017	22	12 05 00.67	1.9910	3 47 32.1	10.503
23	10 28 58.11	+ 2.1139	N. 4 45 43.6	− 11.027	23	12 07 00.09	+ 1.9896	S. 3 58 01.4	− 10.473
	SUNDAY 26.		TUESDAY 28.						

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 31 04.84	+ 2.1102	N. 4 34 41.6	− 11.037	0	12 08 59.42	+ 1.9882	S. 4 08 28.9	− 10.443
1	10 33 11.34	2.1065	4 23 39.1	11.046	1	12 10 58.67	1.9867	4 18 54.6	10.412
2	10 35 17.62	2.1029	4 12 36.1	11.053	2	12 12 57.83	1.9854	4 29 18.4	10.380
3	10 37 23.69	2.0993	4 01 32.7	11.060	3	12 14 56.92	1.9842	4 39 40.2	10.347
4	10 39 29.54	2.0957	3 50 28.9	11.066	4	12 16 55.94	1.9830	4 50 00.1	10.315
5	10 41 35.18	2.0922	3 39 24.8	11.070	5	12 18 54.88	1.9818	5 00 18.0	10.282
6	10 43 40.61	2.0888	3 28 20.5	11.074	6	12 20 53.76	1.9807	5 10 33.9	10.248
7	10 45 45.84	2.0854	3 17 15.9	11.077	7	12 22 52.57	1.9797	5 20 47.8	10.213
8	10 47 50.86	2.0821	3 06 11.2	11.078	8	12 24 51.32	1.9786	5 30 59.5	10.177
9	10 49 55.69	2.0788	2 55 06.5	11.078	9	12 26 50.00	1.9776	5 41 09.0	10.141
10	10 52 00.32	2.0756	2 44 01.8	11.078	10	12 28 48.63	1.9767	5 51 16.4	10.105
11	10 54 04.76	2.0723	2 32 57.1	11.077	11	12 30 47.21	1.9758	6 01 21.6	10.067
12	10 56 09.00	2.0692	2 21 52.5	11.075	12	12 32 45.73	1.9749	6 11 24.5	10.029
13	10 58 13.06	2.0661	2 10 48.1	11.072	13	12 34 44.20	1.9742	6 21 25.1	9.991
14	11 00 16.93	2.0630	1 59 43.9	11.067	14	12 36 42.63	1.9735	6 31 23.4	9.952
15	11 02 20.62	2.0600	1 48 40.0	11.062	15	12 38 41.02	1.9727	6 41 19.4	9.913
16	11 04 24.13	2.0570	1 37 36.4	11.057	16	12 40 39.36	1.9720	6 51 13.0	9.872
17	11 06 27.46	2.0541	1 26 33.1	11.051	17	12 42 37.66	1.9714	7 01 04.1	9.832
18	11 08 30.62	2.0512	1 15 30.3	11.042	18	12 44 35.93	1.9709	7 10 52.8	9.791
19	11 10 33.61	2.0484	1 04 28.0	11.033	19	12 46 34.17	1.9704	7 20 39.0	9.749
20	11 12 36.43	2.0457	0 53 26.3	11.024	20	12 48 32.38	1.9698	7 30 22.7	9.707
21	11 14 39.09	2.0430	0 42 25.1	11.014	21	12 50 30.55	1.9693	7 40 03.8	9.663
22	11 16 41.59	2.0402	0 31 24.6	11.003	22	12 52 28.70	1.9690	7 49 42.3	9.620
23	11 18 43.92	2.0376	0 20 24.7	10.992	23	12 54 26.83	1.9687	7 59 18.2	9.576
24	11 20 46.10	+ 2.0351	N. 0 09 25.6	− 10.978	24	12 56 24.94	+ 1.9683	S. 8 08 51.4	− 9.531

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 29.					**FRIDAY 31.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 56 24.94	+ 1.9683	S. 8 08 51.4	− 9.531	0	14 31 15.31	+ 1.9960	S. 14 45 45.4	− 6.828
1	12 58 23.03	1.9681	8 18 21.9	9.486	1	14 33 15.11	1.9973	14 52 33.1	6.762
2	13 00 21.11	1.9679	8 27 49.7	9.441	2	14 35 14.99	1.9987	14 59 16.8	6.69,
3	13 02 19.18	1.9677	8 37 14.8	9.395	3	14 37 14.95	2.0000	15 05 56.4	6.626
4	13 04 17.23	1.9675	8 46 37.1	9.348	4	14 39 14.99	2.0013	15 12 31.9	6.557
5	13 06 15.28	1.9674	8 55 56.6	9.301	5	14 41 15.11	2.0027	15 19 03.2	6.488
6	13 08 13.32	1.9673	9 05 13.2	9.253	6	14 43 15.32	2.0042	15 25 30.4	6.419
7	13 10 11.36	1.9673	9 14 27.0	9.206	7	14 45 15.62	2.0057	15 31 53.5	6.350
8	13 12 09.40	1.9673	9 23 37.9	9.157	8	14 47 16.00	2.0070	15 38 12.4	6.280
9	13 14 07.44	1.9674	9 32 45.8	9.107	9	14 49 16.46	2.0085	15 44 27.1	6.209
10	13 16 05.49	1.9675	9 41 50.8	9.058	10	14 51 17.02	2.0100	15 50 37.5	6.137
11	13 18 03.54	1.9675	9 50 52.8	9.008	11	14 53 17.66	2.0114	15 56 43.6	6.067
12	13 20 01.59	1.9677	9 59 51.8	8.957	12	14 55 18.39	2.0129	16 02 45.5	5.996
13	13 21 59.66	1.9680	10 08 47.7	8.907	13	14 57 19.21	2.0145	16 08 43.1	5.923
14	13 23 57.75	1.9682	10 17 40.6	8.855	14	14 59 20.13	2.0161	16 14 36.3	5.850
15	13 25 55.85	1.9685	10 26 30.3	8.802	15	15 01 21.14	2.0176	16 20 25.1	5.777
16	13 27 53.97	1.9688	10 35 16.9	8.750	16	15 03 22.24	2.0192	16 26 09.6	5.704
17	13 29 52.11	1.9692	10 44 00.3	8.697	17	15 05 23.44	2.0207	16 31 49.6	5.630
18	13 31 50.27	1.9695	10 52 40.5	8.643	18	15 07 24.73	2.0223	16 37 25.2	5.557
19	13 33 48.45	1.9699	11 01 17.5	8.590	19	15 09 26.12	2.0240	16 42 56.4	5.482
20	13 35 46.66	1.9704	11 09 51.3	8.536	20	15 11 27.61	2.0256	16 48 23.1	5.407
21	13 37 44.90	1.9709	11 18 21.8	8.481	21	15 13 29.19	2.0272	16 53 45.3	5.332
22	13 39 43.17	1.9715	11 26 49.0	8.425	22	15 15 30.87	2.0288	16 59 02.9	5.256
23	13 41 41.48	+ 1.9721	S.11 35 12.8	− 8.369	23	15 17 32.65	+ 2.0304	S.17 04 16.0	− 5.181
	THURSDAY 30.					**SATURDAY, FEBRUARY 1.**			
0	13 43 39.82	+ 1.9727	S.11 43 33.3	− 8.313	0	15 19 34.52	+ 2.0321	S.17 09 24.6	− 5.105
1	13 45 38.20	1.9732	11 51 50.4	8.257					
2	13 47 36.61	1.9739	12 00 04.1	8.199					
3	13 49 35.07	1.9747	12 08 14.3	8.141					
4	13 51 33.57	1.9753	12 16 21.0	8.082					
5	13 53 32.11	1.9762	12 24 24.2	8.024					
6	13 55 30.71	1.9770	12 32 23.9	7.966					
7	13 57 29.35	1.9777	12 40 20.1	7.907					
8	13 59 28.04	1.9786	12 48 12.7	7.846					
9	14 01 26.78	1.9794	12 56 01.6	7.785					
10	14 03 25.57	1.9803	13 03 46.9	7.725		**PHASES OF THE MOON.**			
11	14 05 24.42	1.9813	13 11 28.6	7.664					
12	14 07 23.33	1.9823	13 19 06.6	7.603					
13	14 09 22.30	1.9833	13 26 40.9	7.540					
14	14 11 21.33	1.9843	13 34 11.4	7.477				d h m	
15	14 13 20.42	1.9854	13 41 38.2	7.415	☾	Last Quarter . . . Jan.		1 04 07.8	
16	14 15 19.58	1.9865	13 49 01.2	7.351	●	New Moon		9 09 14.6	
17	14 17 18.80	1.9876	13 56 20.3	7.287	☽	First Quarter		16 18 38.4	
18	14 19 18.09	1.9887	14 03 35.6	7.222	○	Full Moon		23 12 06.2	
19	14 21 17.44	1.9898	14 10 47.0	7.158	☾	Last Quarter		31 01 08.6	
20	14 23 16.87	1.9911	14 17 54.6	7.093					
21	14 25 16.37	1.9922	14 24 58.2	7.027					
22	14 27 15.94	1.9935	14 31 57.9	6.962				d h	
23	14 29 15.59	1.9947	14 38 53.7	6.896	☾	Apogee . . . . . . Jan.		4 15.7	
24	14 31 15.31	+ 1.9960	S.14 45 45.4	− 6.828	☾	Perigee		20 18.1	

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Pollux W.	76 49 08	3026	78 18 49	3037	79 48 16	3047	81 17 31	3056
	Regulus W.	39 53 22	2978	41 24 02	2988	42 54 30	2997	44 24 47	3005
	Antares E.	60 02 08	2977	58 31 26	2989	57 00 59	3001	55 30 47	3012
	Sun E.	91 55 10	3325	90 31 28	3338	89 08 00	3350	87 44 46	3361
2	Pollux W.	88 40 58	3100	90 09 08	3108	91 37 08	3115	93 05 00	3122
	Regulus W.	51 53 46	3042	53 23 07	3049	54 52 19	3055	56 21 24	3060
	Antares E.	48 03 25	3069	46 34 38	3081	45 06 05	3091	43 37 44	3101
	Sun E.	80 51 43	3412	79 29 40	3421	78 07 47	3429	76 46 03	3436
3	Pollux W.	100 22 19	3152	101 49 26	3157	103 16 27	3161	104 43 23	3166
	Regulus W.	63 45 11	3084	65 13 40	3087	66 42 05	3090	68 10 27	3093
	Spica W.	9 48 33	3065	11 17 26	3066	12 46 17	3069	14 15 05	3072
	Antares E.	36 19 07	3153	34 52 02	3164	33 25 10	3175	31 58 31	3188
	Sun E.	69 59 20	3467	68 38 19	3471	67 17 23	3476	65 56 32	3480
4	Pollux W.	111 56 49	3183	113 23 19	3186	114 49 45	3188	116 16 08	3191
	Regulus W.	75 31 37	3100	76 59 47	3101	78 27 56	3100	79 56 06	3100
	Spica W.	21 38 19	3080	23 06 53	3081	24 35 26	3081	26 03 59	3081
	Sun E.	59 13 10	3492	57 52 37	3493	56 32 05	3494	55 11 34	3495
5	Regulus W.	87 17 12	3091	88 45 32	3090	90 13 54	3087	91 42 20	3082
	Spica W.	33 27 00	3073	34 55 42	3070	36 24 28	3068	37 53 17	3065
	Sun E.	48 28 58	3491	47 08 24	3489	45 47 48	3488	44 27 10	3486
6	Regulus W.	99 05 38	3063	100 34 33	3059	102 03 33	3054	103 32 39	3048
	Spica W.	45 18 29	3044	46 47 47	3039	48 17 12	3034	49 46 43	3029
	Sun E.	37 43 23	3473	36 22 29	3471	35 01 32	3468	33 40 32	3465
11	Sun W.	19 24 01	3228	20 49 37	3205	22 15 40	3184	23 42 08	3164
	a Arietis E.	86 21 37	2803	84 47 13	2795	83 12 38	2787	81 37 53	2779
	Aldebaran E.	119 35 14	2750	117 59 41	2742	116 23 57	2733	114 48 01	2725
12	Sun W.	30 59 53	3086	32 28 20	3073	33 57 04	3060	35 26 03	3047
	a Arietis E.	73 41 36	2742	72 05 52	2735	70 29 59	2728	68 53 56	2720
	Aldebaran E.	106 45 33	2682	105 08 29	2674	103 31 14	2666	101 53 48	2657
13	Sun W.	42 54 36	2991	44 25 00	2981	45 55 37	2970	47 26 27	2960
	Mars W.	26 38 51	2999	28 09 05	2980	29 39 43	2961	31 10 45	2943
	a Arietis E.	60 51 30	2690	59 14 36	2685	57 37 36	2680	56 00 29	2675
	Aldebaran E.	93 43 47	2615	92 05 12	2607	90 26 27	2599	88 47 30	2590
14	Sun W.	55 03 52	2909	56 35 59	2899	58 08 19	2889	59 40 52	2879
	Mars W.	38 51 00	2870	40 23 57	2857	41 57 11	2844	43 30 41	2831
	Venus W.	17 16 57	2722	18 53 08	2709	20 29 36	2694	22 06 24	2677
	a Arietis E.	47 53 24	2657	46 15 46	2655	44 38 06	2654	43 00 24	2653
	Aldebaran E.	80 29 52	2548	78 49 45	2540	77 09 27	2531	75 28 57	2523
15	Sun W.	67 26 44	2831	69 00 32	2821	70 34 33	2811	72 08 47	2801
	Mars W.	51 22 04	2775	52 57 04	2764	54 32 19	2753	56 07 48	2742
	Fomalhaut W.	37 37 50	3953	38 50 16	3838	40 04 39	3734	41 20 50	3639
	Venus W.	30 15 43	2607	31 54 29	2594	33 33 32	2582	35 12 52	2570

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Pollux	W.	82 46 35	3065	84 15 27	3074	85 44 08	3083	87 12 38	3091
	Regulus	W.	45 54 54	3013	47 24 51	3021	48 54 38	3028	50 24 16	3034
	Antares	E.	54 00 49	3024	52 31 07	3036	51 01 39	3047	49 32 25	3059
	SUN	E.	86 21 45	3372	84 58 57	3383	83 36 21	3393	82 13 56	3403
2	Pollux	W.	94 32 43	3129	96 00 18	3135	97 27 45	3141	98 55 05	3146
	Regulus	W.	57 50 22	3066	59 19 13	3071	60 47 58	3076	62 16 37	3080
	Antares	E.	42 09 35	3111	40 41 39	3122	39 13 56	3132	37 46 25	3143
	SUN	E.	75 24 27	3443	74 03 00	3450	72 41 40	3456	71 20 27	3462
3	Pollux	W.	106 10 13	3170	107 36 58	3173	109 03 39	3177	110 30 16	3180
	Regulus	W.	69 38 45	3095	71 07 01	3097	72 35 14	3098	74 03 26	3099
	Spica	W.	15 43 49	3074	17 12 30	3077	18 41 08	3078	20 09 44	3079
	Antares	E.	30 32 08	3202	29 06 01	3217	27 40 12	3233	26 14 41	3250
	SUN	E.	64 35 45	3483	63 15 02	3486	61 54 22	3488	60 33 45	3490
4	Pollux	W.	117 42 28	3193	119 08 45	3196	120 34 59	3197	122 01 11	3198
	Regulus	W.	81 24 16	3098	82 52 28	3098	84 20 40	3096	85 48 55	3094
	Spica	W.	27 32 32	3080	29 01 06	3078	30 29 42	3077	31 58 20	3075
	SUN	E.	53 51 04	3495	52 30 34	3494	51 10 03	3493	49 49 31	3492
5	Regulus	W.	93 10 51	3079	94 39 26	3076	96 08 05	3072	97 36 49	3068
	Spica	W.	39 22 10	3061	40 51 07	3057	42 20 09	3053	43 49 16	3048
	SUN	E.	43 06 30	3483	41 45 47	3481	40 25 02	3479	39 04 14	3476
6	Regulus	W.	105 01 52	3043	106 31 12	3038	108 00 38	3031	109 30 12	3026
	Spica	W.	51 16 20	3023	52 46 04	3017	54 15 56	3010	55 45 56	3005
	SUN	E.	32 19 29	3463	30 58 24	3461	29 37 16	3459	28 16 06	3458
11	SUN	W.	25 09 00	3146	26 36 14	3129	28 03 49	3114	29 31 42	3099
	a Arietis	E.	80 02 57	2771	78 27 51	2764	76 52 36	2756	75 17 11	2749
	Aldebaran	E.	113 11 54	2716	111 35 36	2707	109 59 06	2699	108 22 25	2691
12	SUN	W.	36 55 17	3036	38 24 45	3024	39 54 28	3013	41 24 25	3001
	a Arietis	E.	67 17 43	2714	65 41 22	2708	64 04 53	2702	62 28 16	2695
	Aldebaran	E.	100 16 10	2649	98 38 21	2640	97 00 21	2632	95 22 10	2624
13	SUN	W.	48 57 31	2950	50 28 47	2939	52 00 16	2929	53 31 58	2920
	MARS	W.	32 42 09	2927	34 13 53	2912	35 45 57	2898	37 18 19	2884
	a Arietis	E.	54 23 15	2670	52 45 55	2666	51 08 29	2663	49 30 59	2660
	Aldebaran	E.	87 08 21	2582	85 29 01	2574	83 49 30	2565	82 09 47	2556
14	SUN	W.	61 13 37	2869	62 46 35	2860	64 19 45	2850	65 53 08	2840
	MARS	W.	45 04 28	2820	46 38 30	2809	48 12 46	2797	49 47 18	2786
	VENUS	W.	23 43 35	2660	25 21 09	2645	26 59 03	2632	28 37 14	2619
	a Arietis	E.	41 22 41	2655	39 45 00	2657	38 07 22	2660	36 29 48	2666
	Aldebaran	E.	73 48 16	2515	72 07 23	2506	70 26 18	2497	68 45 01	2489
15	SUN	W.	73 43 14	2791	75 17 54	2782	76 52 46	2772	78 27 51	2762
	MARS	W.	57 43 32	2732	59 19 30	2721	60 55 42	2710	62 32 09	2700
	Fomalhaut	W.	42 38 42	3555	43 58 06	3480	45 18 53	3409	46 40 59	3345
	VENUS	W.	36 52 28	2559	38 32 20	2546	40 12 29	2535	41 52 54	2523

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object	Noon.	P.L. of Diff.	IIIh.	P.L. of Diff.	VIh.	P.L. of Diff.	IXh.	P.L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
15	Aldebaran E.	67 03 32	2480	65 21 51	2471	63 39 57	2463	61 57 52	2455
	Pollux E.	109 28 04	2570	107 48 28	2560	106 08 38	2550	104 28 34	2539
16	Sun W.	80 03 09	2752	81 38 40	2743	83 14 23	2733	84 50 19	2723
	Mars W.	64 08 49	2690	65 45 42	2680	67 22 49	2670	69 00 09	2660
	Fomalhaut W.	48 04 19	3287	49 28 46	3234	50 54 15	3184	52 20 43	3138
	Venus W.	43 33 35	2512	45 14 31	2502	46 55 42	2490	48 37 09	2479
	Aldebaran E.	53 24 25	2412	51 41 07	2403	49 57 37	2395	48 13 55	2387
	Pollux E.	96 04 42	2490	94 23 15	2482	92 41 36	2472	90 59 43	2463
17	Sun W.	92 53 11	2676	94 30 23	2667	96 07 47	2657	97 45 24	2649
	Mars W.	77 10 13	2611	78 48 53	2601	80 27 46	2592	82 06 52	2583
	Fomalhaut W.	59 45 40	2956	61 16 48	2927	62 48 33	2899	64 20 53	2873
	Venus W.	57 08 16	2425	58 51 15	2415	60 34 29	2404	62 17 58	2394
	a Pegasi W.	40 51 34	2720	42 27 47	2687	44 04 44	2656	45 42 23	2627
	Aldebaran E.	39 32 33	2348	37 47 43	2340	36 02 42	2333	34 17 31	2326
	Pollux E.	82 27 16	2421	80 44 11	2414	79 00 56	2406	77 17 30	2398
	Regulus E.	119 06 11	2355	117 21 32	2346	115 36 40	2337	113 51 34	2328
18	Sun W.	105 56 27	2606	107 35 14	2599	109 14 11	2591	110 53 19	2583
	Mars W.	90 25 26	2540	92 05 44	2531	93 46 14	2523	95 26 55	2516
	Fomalhaut W.	72 10 07	2769	73 45 16	2753	75 20 46	2737	76 56 37	2722
	Venus W.	70 59 02	2344	72 43 57	2335	74 29 06	2326	76 14 28	2317
	a Pegasi W.	53 59 24	2515	55 40 17	2497	57 21 35	2480	59 03 17	2463
	Pollux E.	68 37 53	2368	66 53 32	2363	65 09 04	2359	63 24 29	2355
	Regulus E.	105 02 49	2284	103 16 26	2277	101 29 53	2269	99 43 08	2261
19	Sun W.	119 11 27	2550	120 51 31	2545	122 31 42	2540	124 12 01	2535
	Mars W.	103 52 50	2482	105 34 29	2476	107 16 16	2470	108 58 11	2466
	Venus W.	85 04 31	2274	86 51 08	2268	88 37 55	2260	90 24 53	2253
	Fomalhaut W.	85 00 11	2667	86 37 35	2660	88 15 09	2653	89 52 52	2648
	a Pegasi W.	67 36 54	2399	69 20 30	2389	71 04 20	2380	72 48 24	2371
	Pollux E.	54 40 30	2345	52 55 36	2346	51 10 44	2348	49 25 54	2351
	Regulus E.	90 46 42	2228	88 58 56	2222	87 11 01	2216	85 22 57	2211
20	Venus W.	99 22 08	2224	101 10 00	2220	102 57 58	2216	104 46 03	2212
	Fomalhaut W.	98 02 44	2638	99 40 47	2641	101 18 46	2644	102 56 41	2648
	a Pegasi W.	81 31 33	2338	83 16 37	2334	85 01 47	2331	86 47 02	2327
	a Arietis W.	37 53 23	2331	39 38 38	2316	41 24 14	2303	43 10 09	2291
	Regulus E.	76 20 54	2191	74 32 13	2188	72 43 27	2186	70 54 38	2184
21	Venus W.	113 47 38	2200	115 36 06	2198	117 24 36	2198	119 13 07	2198
	Fomalhaut W.	111 04 00	2696	112 40 45	2712	114 17 09	2729	115 53 10	2749
	a Pegasi W.	95 33 58	2325	97 19 21	2327	99 04 41	2330	100 49 57	2333
	a Arietis W.	52 03 11	2256	53 50 15	2252	55 37 25	2249	57 24 40	2247
	Aldebaran W.	18 20 29	2215	20 08 34	2208	21 56 49	2203	23 45 12	2199
	Regulus E.	61 50 07	2183	60 01 13	2184	58 12 22	2186	56 23 33	2189
	Spica E.	115 31 19	2160	113 41 51	2159	111 52 22	2161	110 02 55	2162
22	a Arietis W.	66 21 08	2251	68 08 20	2253	69 55 29	2256	71 42 33	2260
	Aldebaran W.	32 47 59	2198	34 36 29	2201	36 24 55	2204	38 13 16	2209
	Regulus E.	47 20 52	2212	45 32 43	2219	43 44 44	2227	41 56 57	2235

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
15	Aldebaran E.	60 15 35	2446	58 33 06	2437	56 50 24	2429	55 07 31	2420
	Pollux E.	102 48 15	2529	101 07 42	2520	99 26 56	2510	97 45 56	2499
16	Sun W.	86 26 28	2713	88 02 50	2704	89 39 24	2695	91 16 11	2685
	Mars W.	70 37 43	2650	72 15 31	2640	73 53 31	2630	75 31 45	2620
	Fomalhaut W.	53 48 07	3096	55 16 22	3057	56 45 24	3021	58 15 11	2987
	Venus W.	50 18 52	2468	52 00 50	2458	53 43 03	2446	55 25 32	2436
	Aldebaran E.	46 30 02	2379	44 45 57	2371	43 01 40	2363	41 17 12	2355
	Pollux E.	89 17 38	2455	87 35 21	2446	85 52 51	2437	84 10 09	2429
17	Sun W.	99 23 13	2640	101 01 13	2631	102 39 26	2622	104 17 51	2614
	Mars W.	83 46 10	2574	85 25 41	2565	87 05 24	2556	88 45 19	2548
	Fomalhaut W.	65 53 46	2849	67 27 10	2827	69 01 02	2806	70 35 22	2787
	Venus W.	64 01 42	2384	65 45 40	2373	67 29 53	2363	69 14 20	2353
	a Pegasi W.	47 20 41	2601	48 59 34	2577	50 39 01	2555	52 18 58	2534
	Aldebaran E.	32 32 10	2320	30 46 40	2315	29 01 02	2309	27 15 16	2304
	Pollux E.	75 33 53	2391	73 50 06	2385	72 06 11	2379	70 22 06	2373
	Regulus E.	112 06 14	2319	110 20 42	2310	108 34 57	2301	106 48 59	2293
18	Sun W.	112 32 38	2575	114 12 07	2569	115 51 44	2562	117 31 31	2556
	Mars W.	97 07 46	2508	98 48 48	2502	100 29 59	2495	102 11 20	2488
	Fomalhaut W.	78 32 48	2709	80 09 16	2697	81 46 00	2686	83 22 59	2676
	Venus W.	78 00 03	2308	79 45 51	2299	81 31 52	2290	83 18 06	2283
	a Pegasi. W.	60 45 22	2449	62 27 47	2436	64 10 31	2422	65 53 34	2410
	Pollux E.	61 39 49	2351	59 55 04	2348	58 10 15	2346	56 25 23	2346
	Regulus E.	97 56 11	2254	96 09 04	2247	94 21 47	2240	92 34 19	2234
19	Sun W.	125 52 26	2531	127 32 56	2527	129 13 32	2523	130 54 13	2520
	Mars W.	110 40 12	2461	112 22 20	2457	114 04 35	2453	115 46 55	2450
	Venus W.	92 12 02	2247	93 59 20	2240	95 46 48	2235	97 34 24	2229
	Fomalhaut W.	91 30 42	2643	93 08 38	2640	94 46 38	2639	96 24 40	2638
	a Pegasi W.	74 32 41	2363	76 17 09	2355	78 01 48	2349	79 46 36	2343
	Pollux E.	47 41 08	2356	45 56 29	2362	44 11 59	2369	42 27 39	2378
	Regulus E.	83 34 46	2206	81 46 27	2202	79 58 02	2198	78 09 31	2194
20	Venus W.	106 34 13	2208	108 22 28	2205	110 10 48	2202	111 59 12	2201
	Fomalhaut W.	104 34 31	2655	106 12 12	2663	107 49 41	2673	109 26 57	2683
	a Pegasi W.	88 32 22	2325	90 17 45	2324	92 03 08	2324	93 48 33	2324
	a Arietis W.	44 56 21	2282	46 42 47	2274	48 29 25	2266	50 16 14	2261
	Regulus E.	69 05 46	2182	67 16 52	2182	65 27 57	2182	63 39 02	2182
21	Venus W.	121 01 37	2199	122 50 06	2200	124 38 34	2202	126 26 59	2204
	Fomalhaut W.	117 28 45	2771	119 03 52	2794	120 38 28	2819	122 12 31	2846
	a Pegasi W.	102 35 08	2337	104 20 13	2343	106 05 09	2350	107 49 55	2359
	a Arietis W.	59 11 57	2247	60 59 15	2246	62 46 34	2247	64 33 52	2248
	Aldebaran W.	25 33 41	2196	27 22 15	2194	29 10 51	2195	30 59 26	2196
	Regulus E.	54 34 49	2192	52 46 10	2196	50 57 37	2201	49 09 11	2206
	Spica E.	108 13 30	2165	106 24 09	2167	104 34 52	2170	102 45 40	2174
22	a Arietis W.	73 29 30	2266	75 16 19	2272	77 03 00	2279	78 49 31	2285
	Aldebaran W.	40 01 30	2214	41 49 36	2220	43 37 33	2227	45 25 21	2234
	Regulus E.	40 09 22	2245	38 22 02	2256	36 34 58	2268	34 48 10	2280

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object	Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
22	Spica E.	100 56 33	2178	99 07 32	2183	97 18 39	2188	95 29 53	2194
23	α Arietis W.	80 35 52	2293	82 22 02	2302	84 07 58	2311	85 53 42	2320
	Aldebaran W.	47 12 59	2241	49 00 25	2250	50 47 38	2259	52 34 38	2268
	Spica E.	86 28 31	2231	84 40 49	2240	82 53 21	2249	81 06 06	2259
24	α Arietis W.	94 38 35	2377	96 22 43	2390	98 06 32	2403	99 50 03	2417
	Aldebaran W.	61 25 59	2322	63 11 26	2334	64 56 36	2347	66 41 27	2359
	Spica E.	72 13 43	2315	70 28 05	2327	68 42 45	2340	66 57 44	2353
	Antares E.	117 35 13	2355	115 50 33	2366	114 06 10	2378	112 22 03	2390
25	α Arietis W.	108 22 26	2493	110 03 49	2510	111 44 48	2527	113 25 24	2544
	Aldebaran W.	75 20 52	2430	77 03 44	2445	78 46 14	2460	80 28 24	2475
	Pollux W.	34 12 01	2701	35 48 40	2694	37 25 28	2690	39 02 21	2689
	Spica E.	58 17 32	2424	56 34 31	2439	54 51 52	2454	53 09 34	2470
	Antares E.	103 46 06	2458	102 03 53	2472	100 22 01	2487	98 40 29	2502
26	Aldebaran W.	88 53 44	2555	90 33 41	2571	92 13 16	2587	93 52 29	2604
	Pollux W.	47 06 18	2710	48 42 44	2719	50 18 59	2728	51 55 02	2738
	Spica E.	44 43 36	2549	43 03 31	2566	41 23 49	2582	39 44 29	2598
	Antares E.	90 18 15	2581	88 38 54	2598	86 59 56	2614	85 21 20	2630
27	Aldebaran W.	102 02 58	2685	103 39 58	2701	105 16 37	2716	106 52 55	2733
	Pollux W.	59 51 46	2795	61 26 21	2808	63 00 38	2820	64 34 40	2833
	Regulus W.	22 49 32	2791	24 24 12	2795	25 58 46	2801	27 33 12	2808
	Spica E.	31 33 24	2680	29 56 17	2696	28 19 32	2712	26 43 08	2727
	Antares E.	77 13 55	2713	75 37 33	2730	74 01 33	2746	72 25 54	2763
	Saturn E.	119 49 52	2736	118 14 00	2752	116 38 29	2768	115 03 19	2783
28	Aldebaran W.	114 49 11	2810	116 23 26	2825	117 57 22	2839	119 30 59	2853
	Pollux W.	72 20 35	2899	73 52 55	2912	75 24 59	2925	76 56 47	2938
	Regulus W.	35 22 50	2855	36 56 07	2866	38 29 10	2876	40 01 59	2887
	Antares E.	64 33 02	2843	62 59 30	2359	61 26 19	2875	59 53 28	2890
	Saturn E.	107 12 26	2859	105 39 14	2873	104 06 20	2887	102 33 44	2900
	Sun E.	123 53 52	3193	122 27 34	3209	121 01 35	3224	119 35 54	3238
29	Pollux W.	84 31 46	2999	86 02 00	3011	87 31 59	3022	89 01 45	3033
	Regulus W.	47 42 31	2942	49 13 56	2953	50 45 07	2963	52 16 06	2973
	Antares E.	52 14 00	2965	50 43 03	2978	49 12 23	2993	47 42 01	3006
	Saturn E.	94 55 01	2965	93 24 05	2978	91 53 25	2989	90 22 59	3000
	Sun E.	112 31 37	3306	111 07 33	3319	109 4? 44	3331	108 20 09	3342
30	Pollux W.	96 27 15	3084	97 55 44	3094	99 2? 01	3102	100 52 08	3110
	Regulus W.	59 48 02	3018	61 17 52	3026	62 47 32	3033	64 17 03	3040
	Antares E.	40 14 31	3077	38 45 53	3091	37 17 32	3105	35 49 29	3119
	Saturn E.	82 54 07	3051	81 24 57	3060	79 55 58	3068	78 27 09	3075
	Sun E.	101 25 25	3396	100 03 04	3405	98 40 53	3414	97 18 52	3422
31	Pollux W.	108 10 16	3148	109 37 27	3155	111 04 30	3161	112 31 26	3168
	Regulus W.	71 42 38	3069	73 11 25	3074	74 40 06	3078	76 08 43	3082
	Saturn E.	71 05 17	3108	69 37 17	3114	68 09 24	3118	66 41 36	3121
	Sun E.	90 30 56	3455	89 09 42	3461	87 48 34	3465	86 27 31	3469

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	Spica	E.	93 41 16	2200	91 52 49	2207	90 04 32	2214	88 16 25	2223
23	α Arietis	W.	87 39 12	2331	89 24 27	2342	91 09 26	2353	92 54 09	2364
	Aldebaran	W.	54 21 25	2278	56 07 57	2289	57 54 13	2299	59 40 14	2310
	Spica	E.	79 19 06	2269	77 32 21	2280	75 45 52	2291	73 59 39	2302
24	α Arietis	W.	101 33 14	2431	103 16 04	2446	104 58 33	2461	106 40 41	2477
	Aldebaran	W.	68 26 00	2373	70 10 13	2387	71 54 06	2401	73 37 39	2415
	Spica	E.	65 13 01	2366	63 28 38	2381	61 44 36	2395	60 00 54	2409
	Antares	E.	110 38 14	2403	108 54 44	2416	107 11 32	2429	105 28 39	2443
25	α Arietis	W.	115 05 36	2562	116 45 23	2581	118 24 44	2599	120 03 41	2617
	Aldebaran	W.	82 10 12	2491	83 51 38	2507	85 32 42	2522	87 13 24	2538
	Pollux	W.	40 39 16	2690	42 16 10	2693	43 52 59	2698	45 29 42	2703
	Spica	E.	51 27 38	2485	49 46 04	2501	48 04 53	2517	46 24 03	2533
	Antares	E.	96 59 19	2518	95 18 31	2533	93 38 04	2549	91 57 59	2564
26	Aldebaran	W.	95 31 19	2620	97 09 47	2637	98 47 52	2652	100 25 36	2669
	Pollux	W.	53 30 52	2748	55 06 28	2760	56 41 49	2771	58 16 55	2782
	Spica	E.	38 05 31	2615	36 26 56	2632	34 48 44	2647	33 10 53	2663
	Antares	E.	83 43 06	2647	82 05 15	2663	80 27 46	2680	78 50 39	2697
27	Aldebaran	W.	108 28 51	2749	110 04 26	2764	111 39 41	2779	113 14 36	2795
	Pollux	W.	66 08 25	2846	67 41 53	2860	69 15 03	2873	70 47 57	2885
	Regulus	W.	29 07 30	2815	30 41 38	2824	32 15 35	2834	33 49 19	2844
	Spica	E.	25 07 04	2744	23 31 22	2759	21 56 00	2775	20 20 59	2790
	Antares	E.	70 50 37	2779	69 15 42	2795	67 41 08	2811	66 06 55	2827
	SATURN	E.	113 28 29	2798	111 53 59	2814	110 19 49	2828	108 45 58	2843
28	Aldebaran	W.	121 04 18	2867	122 37 19	2881	124 10 02	2894	125 42 29	2906
	Pollux	W.	78 28 18	2950	79 59 33	2962	81 30 33	2975	83 01 17	2987
	Regulus	W.	41 34 34	2899	43 06 54	2910	44 39 00	2921	46 10 52	2931
	Antares	E.	58 20 56	2905	56 48 44	2920	55 16 51	2935	53 45 16	2950
	SATURN	E.	101 01 25	2914	99 29 24	2927	97 57 40	2940	96 26 12	2953
	SUN	E.	118 10 30	3253	116 45 23	3266	115 20 32	3280	113 55 57	3293
29	Pollux	W.	90 31 17	3043	92 00 36	3054	93 29 42	3065	94 58 35	3075
	Regulus	W.	53 46 53	2983	55 17 27	2992	56 47 50	3001	58 18 01	3009
	Antares	E.	46 11 56	3021	44 42 09	3034	43 12 39	3048	41 43 26	3063
	SATURN	E.	88 52 46	3011	87 22 47	3022	85 53 02	3032	84 23 29	3041
	SUN	E.	106 56 46	3354	105 33 37	3366	104 10 42	3376	102 47 58	3386
30	Pollux	W.	102 20 05	3119	103 47 52	3127	105 15 29	3134	106 42 57	3141
	Regulus	W.	65 46 26	3047	67 15 40	3054	68 44 46	3060	70 13 45	3065
	Antares	E.	34 21 43	3135	32 54 16	3151	31 27 08	3168	30 00 20	3184
	SATURN	E.	76 58 29	3083	75 29 59	3090	74 01 37	3096	72 33 23	3102
	SUN	E.	95 57 01	3430	94 35 19	3437	93 13 44	3443	91 52 17	3449
31	Pollux	W.	113 58 14	3173	115 24 56	3178	116 51 31	3183	118 18 00	3188
	Regulus	W.	77 37 15	3085	79 05 43	3087	80 34 08	3089	82 02 31	3090
	SATURN	E.	65 13 52	3125	63 46 13	3129	62 18 39	3131	60 51 08	3133
	SUN	E.	85 06 33	3473	83 45 39	3477	82 24 49	3479	81 04 01	3480

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	20 56 45.77	+ 10.211	S. 17 16 37.8	+ 42.23	16 14.90	68.26	13 41.74	0.355
SUN.	2	21 00 50.44	10.177	16 59 35.1	42.99	16 14.75	68.15	13 49.84	0.321
Mon.	3	21 04 54.31	10.143	16 42 14.5	43.73	16 14.60	68.03	13 57.14	0.288
Tues.	4	21 08 57.37	+ 10.110	16 24 36.3	+ 44.45	16 14.45	67.91	14 03.63	0.254
Wed.	5	21 12 59.63	10.077	16 06 41.0	45.15	16 14.29	67.80	14 09.31	0.220
Thur.	6	21 17 01.08	10.043	15 48 29.1	45.84	16 14.13	67.68	14 14.19	0.187
Frid.	7	21 21 01.72	+ 10.010	15 30 00.9	+ 46.50	16 13.96	67.57	14 18.28	0.154
Sat.	8	21 25 01.58	9.977	15 11 17.0	47.15	16 13.79	67.46	14 21.56	0.120
SUN.	9	21 29 00.62	9.944	14 52 17.6	47.78	16 13.61	67.34	14 24.04	0.087
Mon.	10	21 32 58.87	+ 9.910	14 33 03.4	+ 48.40	16 13.43	67.23	14 25.73	0.054
Tues.	11	21 36 56.32	9.877	14 13 34.6	48.99	16 13.25	67.12	14 26.63	0.021
Wed.	12	21 40 52.98	9.844	13 53 51.8	49.57	16 13.06	67.01	14 26.73	0.012
Thur.	13	21 44 48.86	+ 9.812	13 33 55.3	+ 50.12	16 12.87	66.90	14 26.06	0.044
Frid.	14	21 48 43.97	9.780	13 13 45.6	50.67	16 12.68	66.79	14 24.62	0.076
Sat.	15	21 52 38.31	9.748	12 53 23.2	51.19	16 12.48	66.69	14 22.40	0.108
SUN.	16	21 56 31.89	+ 9.717	12 32 48.3	+ 51.70	16 12.28	66.58	14 19.45	0.139
Mon.	17	22 00 24.72	9.686	12 12 01.6	52.19	16 12.08	66.48	14 15.74	0.169
Tues.	18	22 04 16.83	9.656	11 51 03.2	52.66	16 11.87	66.38	14 11.30	0.199
Wed.	19	22 08 08.22	+ 9.627	11 29 53.7	+ 53.12	16 11.66	66.28	14 06.16	0.229
Thur.	20	22 11 58.91	9.598	11 08 33.5	53.56	16 11.45	66.18	14 00.31	0.257
Frid.	21	22 15 48.93	9.570	10 47 02.9	53.98	16 11.23	66.08	13 53.78	0.285
Sat.	22	22 19 38.29	+ 9.543	10 25 22.2	+ 54.39	16 11.01	65.99	13 46.61	0.312
SUN.	23	22 23 27.00	9.517	10 03 31.9	54.78	16 10.79	65.90	13 38.79	0.339
Mon.	24	22 27 15.09	9.492	9 41 32.5	55.16	16 10.57	65.81	13 30.35	0.364
Tues.	25	22 31 02.58	+ 9.467	9 19 24.3	+ 55.52	16 10.34	65.73	13 21.31	0.388
Wed.	26	22 34 49.49	9.443	8 57 07.6	55.86	16 10.11	65.64	13 11.70	0.412
Thur.	27	22 38 35.83	9.420	8 34 43.0	56.19	16 09.87	65.56	13 01.52	0.435
Frid.	28	22 42 21.64	9.398	8 12 10.5	56.50	16 09.63	65.48	12 50.80	0.457
Sat.	29	22 46 06.92	+ 9.376	S. 7 49 30.9	+ 56.79	16 09.39	65.40	12 39.56	0.478

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting 0.19ˢ from the sidereal time. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	20 56 43.44	+ 10.211	S. 17 16 47.4	+ 42.22	13 41.66	− 0.355	2c 43 01.78
SUN.	2	21 00 48.10	10.177	16 59 45.0	42.98	13 49.77	0.321	20 46 58.33
Mon.	3	21 04 51.96	10.143	16 42 24.6	43.72	13 57.07	0.288	20 50 54.89
Tues.	4	21 08 55.01	+ 10.110	16 24 46.7	+ 44.44	14 03.57	− 0.254	20 54 51.44
Wed.	5	21 12 57.26	10.077	16 06 51.7	45.14	14 09.26	0.220	20 58 48.00
Thur.	6	21 16 58.70	10.044	15 48 40.0	45.83	14 14.15	0.187	21 02 44.55
Frid.	7	21 20 59.34	+ 10.010	15 30 12.0	+ 46.49	14 18.24	− 0.154	21 06 41.10
Sat.	8	21 24 59.19	9.977	15 11 28.3	47.14	14 21.53	0.120	21 10 37.66
SUN.	9	21 28 58.23	9.944	14 52 29.1	47.77	14 24.02	0.087	21 14 34.21
Mon.	10	21 32 56.48	+ 9.911	14 33 15.1	+ 48.39	14 25.71	− 0.054	21 18 30.77
Tues.	11	21 36 53.94	9.878	14 13 46.4	48.98	14 26.62	− 0.021	21 22 27.32
Wed.	12	21 40 50.61	9.845	13 54 03.8	49.56	14 26.73	+ 0.012	21 26 23.88
Thur.	13	21 44 46.50	+ 9.813	13 34 07.4	+ 50.12	14 26.07	+ 0.044	21 30 20.43
Frid.	14	21 48 41.62	9.781	13 13 57.8	50.67	14 24.64	0.076	21 34 16.98
Sat.	15	21 52 35.97	9.749	12 53 35.5	51.19	14 22.43	0.108	21 38 13.54
SUN.	16	21 56 29.57	+ 9.718	12 33 00.7	+ 51.70	14 19.48	+ 0.139	21 42 10.09
Mon.	17	22 00 22.42	9.687	12 12 14.0	52.19	14 15.78	0.169	21 46 06.64
Tues.	18	22 04 14.55	9.657	11 51 15.7	52.66	14 11.35	0.199	21 50 03.20
Wed.	19	22 08 05.96	+ 9.628	11 30 06.2	+ 53.12	14 06.21	+ 0.229	21 53 59.75
Thur.	20	22 11 56.67	9.599	11 08 46.0	53.56	14 00.37	0.257	21 57 56.30
Frid.	21	22 15 46.71	9.571	10 47 15.4	53.98	13 53.85	0.285	22 01 52.86
Sat.	22	22 19 36.09	+ 9.544	10 25 34.7	+ 54.39	13 46.68	+ 0.312	22 05 49.41
SUN.	23	22 23 24.83	9.518	10 03 44.4	54.78	13 38.87	0.339	22 09 45.96
Mon.	24	22 27 12.95	9.492	9 41 45.0	55.16	13 30.43	0.364	22 13 42.52
Tues.	25	22 31 00.47	+ 9.468	9 19 36.7	+ 55.52	13 21.40	+ 0.388	22 17 39.07
Wed.	26	22 34 47.41	9.444	8 57 19.9	55.86	13 11.79	0.412	22 21 35.62
Thur.	27	22 38 33.79	9.421	8 34 55.2	56.19	13 01.61	0.435	22 25 32.18
Frid.	28	22 42 19.63	9.399	8 12 22.6	56.51	12 50.90	0.457	22 29 28.73
Sat.	29	22 46 04.94	+ 9.378	S. 7 49 42.9	+ 56.80	12 39.66	+ 0.479	22 33 25.28

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour, + 9.8565ˢ. (Table III.)

		AT GREENWICH MEAN NOON.							
		THE SUN'S							
Day of the Month.	Day of the Year.	TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.	
		λ	λ'						
		° ′ ″	′ ″	″	″			h m s	
1	32	311 43 27.4	43 10.8	152.23	− 0.20	9.993 6490	+ 28.0	3 16 25.95	
2	33	312 44 20.4	44 03.6	152.19	− 0.08	9.993 7172	28.7	3 12 30.05	
3	34	313 45 12.5	44 55.6	152.15	+ 0.04	9.993 7870	29.4	3 08 34.14	
4	35	314 46 03.7	45 46.6	152.11	+ 0.14	9.993 8585	+ 30.1	3 04 38.23	
5	36	315 46 53.8	46 36.7	152.07	0.20	9.993 9314	30.7	3 00 42.32	
6	37	316 47 43.0	47 25.7	152.02	0.26	9.994 0057	31.2	2 56 46.41	
7	38	317 48 31.0	48 13.6	151.97	+ 0.29	9.994 0813	+ 31.7	2 52 50.50	
8	39	318 49 17.8	49 00.3	151.92	0.28	9.994 1582	32.2	2 48 54.59	
9	40	319 50 03.3	49 45.7	151.87	0.24	9.994 2361	32.7	2 44 58.69	
10	41	320 50 47.3	50 29.6	151.81	+ 0.18	9.994 3152	+ 33.2	2 41 02.78	
11	42	321 51 30.0	51 12.2	151.75	+ 0.08	9.994 3954	33.7	2 37 06.87	
12	43	322 52 11.1	51 53.1	151.68	− 0.02	9.994 4768	34.2	2 33 10.96	
13	44	323 52 50.5	52 32.4	151.61	− 0.16	9.994 5595	+ 34.7	2 29 15.05	
14	45	324 53 28.2	53 10.0	151.53	0.29	9.994 6434	35.3	2 25 19.14	
15	46	325 54 04.1	53 45.8	151.46	0.40	9.994 7288	35.9	2 21 23.24	
16	47	326 54 38.2	54 19.8	151.38	− 0.52	9.994 8158	+ 36.6	2 17 27.33	
17	48	327 55 10.5	54 51.9	151.30	0.63	9.994 9044	37.3	2 13 31.42	
18	49	328 55 40.9	55 22.3	151.23	0.70	9.994 9948	38.1	2 09 35.51	
19	50	329 56 09.6	55 50.8	151.15	− 0.76	9.995 0871	+ 38.9	2 05 39.60	
20	51	330 56 36.4	56 17.5	151.08	0.78	9.995 1813	39.7	2 01 43.70	
21	52	331 57 01.5	56 42.5	151.01	0.75	9.995 2775	40.5	1 57 47.79	
22	53	332 57 24.8	57 05.8	150.94	− 0.71	9.995 3758	+ 41.3	1 53 51.88	
23	54	333 57 46.6	57 27.4	150.87	0.64	9.995 4760	42.1	1 49 55.98	
24	55	334 58 06.6	57 47.3	150.80	0.54	9.995 5782	42.9	1 46 00.07	
25	56	335 58 25.1	58 05.7	150.73	− 0.43	9.995 6821	+ 43.7	1 42 04.16	
26	57	336 58 42.1	58 22.6	150.67	0.31	9.995 7877	44.4	1 38 08.26	
27	58	337 58 57.5	58 37.9	150.61	0.19	9.995 8950	45.0	1 34 12.35	
28	59	338 59 11.4	58 51.7	150.55	− 0.06	9.996 0038	45.5	1 30 16.44	
29	60	339 59 23.7	59 04.0	150.48	+ 0.05	9.996 1138	+ 46.1	1 26 20.54	

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' to the mean equinox of January 0.0ᵈ of the Besselian fictitious year.

Diff. for 1 Hour
− 9.8296ˢ.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	″	′ ″	″	′ ″	″	h m	m	d
1	14 48.0	14 47.7	54 13.3	− 0.21	54 12.1	0.00	19 12.7	+ 1.96	22.6
2	14 48.1	14 49.1	54 13.4	+ 0.21	54 17.2	+ 0.41	20 00.4	2.01	23.6
3	14 50.8	14 53.0	54 23.4	0.60	54 31.7	0.78	20 49.0	2.04	24.6
4	14 55.9	14 59.2	54 42.0	+ 0.93	54 54.2	+ 1.07	21 38.1	+ 2.05	25.6
5	15 02.9	15 07.0	55 07.8	1.19	55 22.7	1.28	22 27.5	2.05	26.6
6	15 11.3	15 15.9	55 38.6	1.36	55 55.3	1.40	23 16.7	2.04	27.6
7	15 20.5	15 25.2	56 12.3	+ 1.43	56 29.6	+ 1.42	☽		28.6
8	15 29.8	15 34.4	56 46.6	1.40	57 03.3	1.37	0 05.7	+ 2.03	29.6
9	15 38.8	15 42.9	57 19.4	1.30	57 34.7	1.23	0 54.3	2.03	0.9
10	15 46.8	15 50.4	57 49.0	+ 1.15	58 02.3	+ 1.06	1 43.1	+ 2.04	1.9
11	15 53.8	15 56.8	58 14.6	0.98	58 25.5	0.88	2 32.3	2.07	2.9
12	15 59.5	16 01.8	58 35.4	0.77	58 44.1	0.68	3 22.7	2.13	3.9
13	16 03.9	16 05.7	58 51.7	+ 0.59	58 58.3	+ 0.49	4 14.7	+ 2.21	4.9
14	16 07.2	16 08.4	59 03.7	0.40	59 08.2	0.32	5 08.7	2.30	5.9
15	16 09.3	16 10.0	59 11.6	0.23	59 13.8	+ 0.14	6 04.9	2.38	6.9
16	16 10.3	16 10.3	59 15.0	+ 0.05	59 15.1	− 0.05	7 02.6	+ 2.43	7.9
17	16 09.9	16 09.2	59 13.7	− 0.17	59 ·11.0	0.29	8 01.1	2.43	8.9
18	16 08.0	16 06.4	59 06.8	0.42	59 01.0	0.55	8 59.0	2.38	9.9
19	16 04.4	16 01.9	58 53.5	− 0.70	58 44.2	− 0.84	9 55.2	+ 2.30	10.9
20	15 58.9	15 55.4	58 33.2	0.98	58 20.6	1.12	10 49.1	2.19	11.9
21	15 51.5	15 47.2	58 06.2	1.25	57 5c.5	1.36	11 40.5	2.09	12.9
22	15 42.6	15 37.7	57 33.6	− 1.45	57 15.6	− 1.52	12 29.6	+ 2.00	13.9
23	15 32.7	15 27.5	56 57.0	1.57	56 38.0	1.58	13 16.8	1.94	14.9
24	15 22.3	15 17.2	56 18.9	1.57	56 00.2	1.53	14 02.9	1.90	15.9
25	15 12.2	15 07.6	55 42.0	− 1.47	55 24.9	− 1.37	14 48.3	+ 1.89	16.9
26	15 03.2	14 59.4	55 09.1	1.25	54 54.8	1.11	15 33.7	1.90	17.9
27	14 56.0	14 53.1	54 42.4	0.95	54 32.0	0.77	16 19.4	1.92	18.9
28	14 50.9	14 49.4	54 23.9	0.58	54 18.2	− 0.37	17 05.7	1.95	19.9
29	14 48.5	14 48.3	54 15.0	− 0.16	54 14.4	+ 0.06	17 52.9	+ 1.99	20.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 1.					**MONDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 19 34.52	+2.0321	S.17 09 24.6	−5.105	0	16 59 03.86	+2.1112	S.19 39 39.6	−1.034
1	15 21 36.50	2.0338	17 14 28.6	5.027	1	17 01 10.57	2.1126	19 40 38.9	0.942
2	15 23 38.58	2.0355	17 19 27.9	4.950	2	17 03 17.37	2.1140	19 41 32.7	0.851
3	15 25 40.76	2.0372	17 24 22.6	4.872	3	17 05 24.25	2.1153	19 42 21.0	0.758
4	15 27 43.04	2.0388	17 29 12.6	4.794	4	17 07 31.21	2.1167	19 43 03.7	0.666
5	15 29 45.42	2.0406	17 33 57.9	4.716	5	17 09 38.25	2.1180	19 43 40.9	0.573
6	15 31 47.91	2.0422	17 38 38.5	4.637	6	17 11 45.37	2.1193	19 44 12.5	0.480
7	15 33 50.49	2.0439	17 43 14.4	4.558	7	17 13 52.57	2.1207	19 44 38.5	0.387
8	15 35 53.18	2.0457	17 47 45.5	4.479	8	17 15 59.85	2.1219	19 44 59.0	0.295
9	15 37 55.97	2.0473	17 52 11.9	4.400	9	17 18 07.20	2.1231	19 45 13.9	0.202
10	15 39 58.86	2.0491	17 56 33.5	4.319	10	17 20 14.62	2.1243	19 45 23.2	0.107
11	15 42 01.86	2.0508	18 00 50.2	4.238	11	17 22 22.12	2.1256	19 45 26.8	−0.013
12	15 44 04.96	2.0525	18 05 02.1	4.158	12	17 24 29.69	2.1267	19 45 24.8	+0.080
13	15 46 08.16	2.0543	18 09 09.2	4.077	13	17 26 37.33	2.1279	19 45 17.2	0.174
14	15 48 11.47	2.0561	18 13 11.3	3.995	14	17 28 45.04	2.1291	19 45 03.9	0.268
15	15 50 14.89	2.0578	18 17 08.6	3.913	15	17 30 52.82	2.1302	19 44 45.0	0.362
16	15 52 18.41	2.0595	18 21 00.9	3.831	16	17 33 00.66	2.1312	19 44 20.4	0.457
17	15 54 22.03	2.0612	18 24 48.3	3.748	17	17 35 08.56	2.1322	19 43 50.1	0.552
18	15 56 25.75	2.0629	18 28 30.7	3.666	18	17 37 16.53	2.1333	19 43 14.2	0.646
19	15 58 29.58	2.0647	18 32 08.2	3.582	19	17 39 24.56	2.1343	19 42 32.6	0.741
20	16 00 33.51	2.0663	18 35 40.6	3.498	20	17 41 32.65	2.1353	19 41 45.3	0.836
21	16 02 37.54	2.0680	18 39 08.0	3.414	21	17 43 40.80	2.1363	19 40 52.3	0.931
22	16 04 41.67	2.0697	18 42 30.3	3.330	22	17 45 49.01	2.1372	19 39 53.6	1.026
23	16 06 45.91	+2.0715	S.18 45 47.6	−3.246	23	17 47 57.27	+2.1381	S.19 38 49.2	+1.121
	SUNDAY 2.					**TUESDAY 4.**			
0	16 08 50.25	+2.0732	S.18 48 59.8	−3.161	0	17 50 05.58	+2.1390	S.19 37 39.1	+1.216
1	16 10 54.69	2.0749	18 52 06.9	3.076	1	17 52 13.95	2.1399	19 36 23.3	1.311
2	16 12 59.24	2.0767	18 55 08.9	2.990	2	17 54 22.37	2.1407	19 35 01.8	1.407
3	16 15 03.89	2.0783	18 58 05.7	2.904	3	17 56 30.84	2.1416	19 33 34.5	1.502
4	16 17 08.63	2.0799	19 00 57.4	2.818	4	17 58 39.36	2.1423	19 32 01.5	1.597
5	16 19 13.48	2.0817	19 03 43.9	2.732	5	18 00 47.92	2.1431	19 30 22.8	1.692
6	16 21 18.43	2.0833	19 06 25.2	2.645	6	18 02 56.53	2.1438	19 28 38.4	1.788
7	16 23 23.48	2.0849	19 09 01.3	2.557	7	18 05 05.18	2.1445	19 26 48.2	1.884
8	16 25 28.62	2.0866	19 11 32.1	2.470	8	18 07 13.87	2.1452	19 24 52.3	1.979
9	16 27 33.87	2.0882	19 13 57.7	2.382	9	18 09 22.61	2.1459	19 22 50.7	2.075
10	16 29 39.21	2.0898	19 16 18.0	2.294	10	18 11 31.38	2.1465	19 20 43.3	2.171
11	16 31 44.65	2.0915	19 18 33.0	2.206	11	18 13 40.19	2.1471	19 18 30.2	2.266
12	16 33 50.19	2.0931	19 20 42.7	2.117	12	18 15 49.03	2.1477	19 16 11.4	2.361
13	16 35 55.82	2.0947	19 22 47.1	2.028	13	18 17 57.91	2.1482	19 13 46.9	2.457
14	16 38 01.55	2.0962	19 24 46.1	1.939	14	18 20 06.82	2.1488	19 11 16.6	2.552
15	16 40 07.37	2.0978	19 26 39.8	1.851	15	18 22 15.77	2.1493	19 08 40.6	2.647
16	16 42 13.29	2.0994	19 28 28.2	1.761	16	18 24 24.74	2.1497	19 05 58.9	2.742
17	16 44 19.30	2.1009	19 30 11.1	1.670	17	18 26 33.74	2.1502	19 03 11.5	2.837
18	16 46 25.40	2.1024	19 31 48.6	1.580	18	18 28 42.76	2.1506	19 00 18.4	2.932
19	16 48 31.59	2.1038	19 33 20.7	1.490	19	18 30 51.81	2.1511	18 57 19.6	3.027
20	16 50 37.86	2.1053	19 34 47.4	1.400	20	18 33 00.89	2.1514	18 54 15.1	3.123
21	16 52 44.23	2.1069	19 36 08.7	1.309	21	18 35 09.98	2.1517	18 51 04.8	3.218
22	16 54 50.69	2.1093	19 37 24.5	1.217	22	18 37 19.10	2.1521	18 47 48.9	3.312
23	16 56 57.23	2.1097	19 38 34.8	1.126	23	18 39 28.23	2.1523	18 44 27.3	3.407
24	16 59 03.86	+2.1112	S.19 39 39.6	−1.034	24	18 41 37.38	+2.1527	S.18 41 00.0	+3.502

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 5. / FRIDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 41 37.38	+2.1527	S.18 41 00.0	+3.502	0	20 24 51.00	+2.1421	S.14 08 33.6	+7.715
1	18 43 46.55	2.1529	18 37 27.0	3.597	1	20 26 59.51	2.1417	14 00 48.4	7.792
2	18 45 55.73	2.1531	18 33 48.4	3.690	2	20 29 08.00	2.1412	13 52 58.6	7.868
3	18 48 04.92	2.1533	18 30 04.2	3.784	3	20 31 16.45	2.1406	13 45 04.2	7.944
4	18 50 14.13	2.1535	18 26 14.3	3.877	4	20 33 24.87	2.1401	13 37 05.3	8.019
5	18 52 23.34	2.1536	18 22 18.7	3.972	5	20 35 33.26	2.1396	13 29 01.9	8.094
6	18 54 32.56	2.1537	18 18 17.6	4.066	6	20 37 41.62	2.1390	13 20 54.0	8.169
7	18 56 41.79	2.1538	18 14 10.8	4.160	7	20 39 49.94	2.1384	13 12 41.6	8.243
8	18 58 51.02	2.1538	18 09 58.4	4.252	8	20 41 58.23	2.1379	13 04 24.8	8.316
9	19 01 00.25	2.1539	18 05 40.5	4.345	9	20 44 06.49	2.1374	12 56 03.7	8.388
10	19 03 09.49	2.1540	18 01 17.0	4.438	10	20 46 14.72	2.1369	12 47 38.2	8.460
11	19 05 18.73	2.1540	17 56 47.9	4.531	11	20 48 22.92	2.1364	12 39 08.5	8.531
12	19 07 27.97	2.1540	17 52 13.3	4.622	12	20 50 31.09	2.1359	12 30 34.5	8.602
13	19 09 37.21	2.1539	17 47 33.2	4.715	13	20 52 39.23	2.1353	12 21 56.3	8.671
14	19 11 46.44	2.1538	17 42 47.5	4.807	14	20 54 47.33	2.1347	12 13 14.0	8.740
15	19 13 55.67	2.1537	17 37 56.3	4.898	15	20 56 55.40	2.1343	12 04 27.5	8.809
16	19 16 04.89	2.1537	17 32 59.7	4.989	16	20 59 03.45	2.1338	11 55 36.9	8.877
17	19 18 14.11	2.1536	17 27 57.6	5.081	17	21 01 11.46	2.1333	11 46 42.3	8.943
18	19 20 23.32	2.1534	17 22 50.0	5.172	18	21 03 19.45	2.1328	11 37 43.7	9.009
19	19 22 32.52	2.1532	17 17 37.0	5.262	19	21 05 27.40	2.1323	11 28 41.2	9.075
20	19 24 41.71	2.1531	17 12 18.6	5.352	20	21 07 35.33	2.1319	11 19 34.7	9.140
21	19 26 50.89	2.1528	17 06 54.7	5.442	21	21 09 43.23	2.1314	11 10 24.4	9.204
22	19 29 00.05	2.1525	17 01 25.5	5.532	22	21 11 51.10	2.1309	11 01 10.2	9.268
23	19 31 09.20	+2.1524	S.16 55 50.9	+5.621	23	21 13 58.94	+2.1305	S.10 51 52.2	+9.331

THURSDAY 6. / SATURDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 33 18.34	+2.1522	S.16 50 11.0	+5.710	0	21 16 06.76	+2.1301	S.10 42 30.5	+9.392
1	19 35 27.46	2.1518	16 44 25.7	5.798	1	21 18 14.55	2.1297	10 33 05.1	9.454
2	19 37 36.56	2.1516	16 38 35.2	5.886	2	21 20 22.32	2.1293	10 23 36.0	9.514
3	19 39 45.65	2.1513	16 32 39.4	5.974	3	21 22 30.07	2.1289	10 14 03.4	9.573
4	19 41 54.72	2.1510	16 26 38.3	6.062	4	21 24 37.79	2.1285	10 04 27.2	9.632
5	19 44 03.77	2.1506	16 20 32.0	6.148	5	21 26 45.49	2.1282	9 54 47.5	9.691
6	19 46 12.79	2.1502	16 14 20.5	6.235	6	21 28 53.17	2.1277	9 45 04.3	9.748
7	19 48 21.80	2.1500	16 08 03.8	6.322	7	21 31 00.82	2.1274	9 35 17.7	9.804
8	19 50 30.79	2.1496	16 01 41.9	6.407	8	21 33 08.46	2.1272	9 25 27.8	9.860
9	19 52 39.75	2.1492	15 55 14.9	6.492	9	21 35 16.08	2.1269	9 15 34.5	9.915
10	19 54 48.69	2.1487	15 48 42.8	6.577	10	21 37 23.69	2.1266	9 05 38.0	9.969
11	19 56 57.60	2.1483	15 42 05.7	6.661	11	21 39 31.27	2.1263	8 55 38.2	10.022
12	19 59 06.49	2.1479	15 35 23.5	6.745	12	21 41 38.84	2.1261	8 45 35.3	10.074
13	20 01 15.35	2.1475	15 28 36.3	6.828	13	21 43 46.40	2.1258	8 35 29.3	10.126
14	20 03 24.19	2.1471	15 21 44.1	6.912	14	21 45 53.94	2.1256	8 25 20.2	10.177
15	20 05 33.00	2.1467	15 14 46.9	6.994	15	21 48 01.47	2.1254	8 15 08.1	10.227
16	20 07 41.79	2.1462	15 07 44.8	7.077	16	21 50 08.99	2.1252	8 04 53.0	10.276
17	20 09 50.54	2.1457	15 00 37.7	7.158	17	21 52 16.49	2.1250	7 54 35.0	10.323
18	20 11 59.27	2.1452	14 53 25.8	7.239	18	21 54 23.99	2.1250	7 44 14.2	10.371
19	20 14 07.97	2.1447	14 46 09.0	7.319	19	21 56 31.49	2.1249	7 33 50.5	10.417
20	20 16 16.64	2.1442	14 38 47.5	7.399	20	21 58 38.98	2.1248	7 23 24.1	10.462
21	20 18 25.27	2.1437	14 31 21.1	7.479	21	22 00 46.46	2.1247	7 12 55.0	10.507
22	20 20 33.88	2.1432	14 23 50.0	7.557	22	22 02 53.94	2.1246	7 02 23.2	10.552
23	20 22 42.46	2.1427	14 16 14.2	7.637	23	22 05 01.41	2.1246	6 51 48.8	10.594
24	20 24 51.00	+2.1421	S.14 08 33.6	+7.715	24	22 07 08.89	+2.1246	S. 6 41 11.9	+10.636

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 9.					**TUESDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 07 08.89	+ 2.1246	S. 6 41 11.9	+ 10.636	0	23 49 42.17	+ 2.1615	N. 2 19 19.1	+ 11.494
1	22 09 16.37	2.1246	6 30 32.5	10.677	1	23 51 51.91	2.1632	2 30 48.5	11.486
2	22 11 23.84	2.1246	6 19 50.7	10.717	2	23 54 01.75	2.1648	2 42 17.4	11.477
3	22 13 31.32	2.1247	6 09 06.5	10.757	3	23 56 11.69	2.1666	2 53 45.8	11.467
4	22 15 38.81	2.1249	5 58 19.9	10.795	4	23 58 21.74	2.1683	3 05 13.5	11.457
5	22 17 46.31	2.1250	5 47 31.1	10.832	5	0 00 31.89	2.1701	3 16 40.6	11.445
6	22 19 53.81	2.1252	5 36 40.0	10.869	6	0 02 42.15	2.1720	3 28 06.9	11.431
7	22 22 01.33	2.1254	5 25 46.8	10.904	7	0 04 52.53	2.1739	3 39 32.3	11.416
8	22 24 08.86	2.1257	5 14 51.5	10.938	8	0 07 03.02	2.1757	3 50 56.8	11.401
9	22 26 16.41	2.1259	5 03 54.2	10.972	9	0 09 13.62	2.1777	4 02 20.4	11.384
10	22 28 23.97	2.1262	4 52 54.9	11.005	10	0 11 24.34	2.1797	4 13 42.9	11.366
11	22 30 31.55	2.1265	4 41 53.6	11.037	11	0 13 35.18	2.1817	4 25 04.3	11.347
12	22 32 39.15	2.1268	4 30 50.5	11.067	12	0 15 46.15	2.1838	4 36 24.6	11.327
13	22 34 46.77	2.1272	4 19 45.5	11.097	13	0 17 57.24	2.1859	4 47 43.6	11.307
14	22 36 54.41	2.1275	4 08 38.8	11.126	14	0 20 08.46	2.1880	4 59 01.4	11.285
15	22 39 02.07	2.1279	3 57 30.4	11.153	15	0 22 19.80	2.1902	5 10 17.8	11.261
16	22 41 09.76	2.1284	3 46 20.4	11.180	16	0 24 31.28	2.1924	5 21 32.7	11.236
17	22 43 17.48	2.1289	3 35 08.8	11.206	17	0 26 42.89	2.1947	5 32 46.1	11.211
18	22 45 25.23	2.1294	3 23 55.7	11.231	18	0 28 54.64	2.1969	5 43 58.0	11.184
19	22 47 33.01	2.1300	3 12 41.1	11.254	19	0 31 06.52	2.1992	5 55 08.2	11.156
20	22 49 40.83	2.1307	3 01 25.2	11.277	20	0 33 18.55	2.2017	6 06 16.7	11.127
21	22 51 48.69	2.1312	2 50 07.9	11.299	21	0 35 30.72	2.2040	6 17 23.4	11.097
22	22 53 56.58	2.1318	2 38 49.3	11.320	22	0 37 43.03	2.2064	6 28 28.3	11.066
23	22 56 04.51	+ 2.1325	S. 2 27 29.5	+ 11.340	23	0 39 55.49	+ 2.2088	N. 6 39 31.3	+ 11.033
	MONDAY 10.					**WEDNESDAY 12.**			
0	22 58 12.48	+ 2.1333	S. 2 16 08.5	+ 11.358	0	0 42 08.09	+ 2.2113	N. 6 50 32.3	+ 10.999
1	23 00 20.50	2.1341	2 04 46.5	11.376	1	0 44 20.84	2.2138	7 01 31.2	10.964
2	23 02 28.57	2.1348	1 53 23.4	11.392	2	0 46 33.75	2.2165	7 12 28.0	10.928
3	23 04 36.68	2.1357	1 41 59.4	11.408	3	0 48 46.82	2.2191	7 23 22.6	10.892
4	23 06 44.85	2.1366	1 30 34.4	11.423	4	0 51 00.04	2.2216	7 34 15.0	10.853
5	23 08 53.07	2.1374	1 19 08.6	11.437	5	0 53 13.41	2.2242	7 45 05.0	10.814
6	23 11 01.34	2.1383	1 07 42.0	11.449	6	0 55 26.95	2.2270	7 55 52.7	10.774
7	23 13 09.67	2.1393	0 56 14.7	11.461	7	0 57 40.65	2.2297	8 06 37.9	10.732
8	23 15 18.06	2.1403	0 44 46.7	11.472	8	0 59 54.51	2.2324	8 17 20.5	10.689
9	23 17 26.51	2.1414	0 33 18.1	11.481	9	1 02 08.54	2.2352	8 28 00.6	10.646
10	23 19 35.03	2.1425	0 21 49.0	11.489	10	1 04 22.74	2.2380	8 38 38.0	10.600
11	23 21 43.61	2.1435	S. 0 10 19.4	11.497	11	1 06 37.10	2.2408	8 49 12.6	10.554
12	23 23 52.25	2.1447	N. 0 01 10.6	11.503	12	1 08 51.64	2.2437	8 59 44.5	10.507
13	23 26 00.97	2.1459	0 12 41.0	11.508	13	1 11 06.35	2.2466	9 10 13.5	10.459
14	23 28 09.76	2.1472	0 24 11.6	11.512	14	1 13 21.23	2.2495	9 20 39.6	10.409
15	23 30 18.63	2.1484	0 35 42.4	11.515	15	1 15 36.29	2.2524	9 31 02.6	10.358
16	23 32 27.57	2.1497	0 47 13.4	11.517	16	1 17 51.52	2.2554	9 41 22.6	10.307
17	23 34 36.59	2.1511	0 58 44.5	11.518	17	1 20 06.94	2.2584	9 51 39.4	10.253
18	23 36 45.70	2.1525	1 10 15.6	11.518	18	1 22 22.53	2.2614	10 01 53.0	10.199
19	23 38 54.89	2.1538	1 21 46.7	11.517	19	1 24 38.31	2.2645	10 12 03.3	10.144
20	23 41 04.16	2.1553	1 33 17.7	11.515	20	1 26 54.27	2.2676	10 22 10.3	10.088
21	23 43 13.53	2.1568	1 44 48.5	11.511	21	1 29 10.42	2.2707	10 32 13.9	10.031
22	23 45 22.98	2.1583	1 56 19.0	11.506	22	1 31 26.75	2.2737	10 42 14.0	9.972
23	23 47 32.53	2.1599	2 07 49.2	11.501	23	1 33 43.27	2.2768	10 52 10.6	9.912
24	23 49 42.17	+ 2.1615	N. 2 19 19.1	+ 11.494	24	1 35 59.98	+ 2.2801	N. 11 02 03.5	+ 9.851

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 35 59.98	+ 2.2801	N.11 02 03.5	+ 9.851
1	1 38 16.88	2.2833	11 11 52.7	9.789
2	1 40 33.97	2.2864	11 21 38.2	9.726
3	1 42 51.25	2.2897	11 31 19.8	9.661
4	1 45 08.73	2.2929	11 40 57.5	9.596
5	1 47 26.40	2.2961	11 50 31.3	9.530
6	1 49 44.26	2.2993	12 00 01.1	9.462
7	1 52 02.32	2.3027	12 09 26.8	9.393
8	1 54 20.58	2.3060	12 18 48.3	9.323
9	1 56 39.04	2.3093	12 28 05.6	9.252
10	1 58 57.69	2.3125	12 37 18.6	9.180
11	2 01 16.54	2.3158	12 46 27.2	9.107
12	2 03 35 59	2.3192	12 55 31.4	9.032
13	2 05 54.84	2.3226	13 04 31.1	8.957
14	2 08 14.30	2.3259	13 13 26 3	8.881
15	2 10 33.95	2.3292	13 22 16.8	8.803
16	2 12 53.80	2.3326	13 31 02.7	8.725
17	2 15 13.86	2.3359	13 39 43.8	8.645
18	2 17 34.11	2.3393	13 48 20.1	8.564
19	2 19 54.57	2.3427	13 56 51.5	8.482
20	2 22 15.23	2.3461	14 05 18.0	8.400
21	2 24 36.10	2.3495	14 13 39.5	8.316
22	2 26 57.17	2.3528	14 21 55.9	8.231
23	2 29 18 43	+ 2.3561	N.14 30 07.2	+ 8.145

FRIDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 31 39.90	+ 2.3595	N.14 38 13.3	+ 8.057
1	2 34 01.57	2.3628	14 46 14.1	7.969
2	2 36 23.44	2.3662	14 54 09.6	7.880
3	2 38 45.51	2.3695	15 01 59.7	7.790
4	2 41 07.78	2.3728	15 09 44.4	7.698
5	2 43 30.25	2.3761	15 17 23.5	7.606
6	2 45 52.91	2.3794	15 24 57.1	7.513
7	2 48 15.78	2.3827	15 32 25.1	7.419
8	2 50 38.84	2.3860	15 39 47.4	7.324
9	2 53 02.10	2.3892	15 47 04.0	7.227
10	2 55 25.55	2.3925	15 54 14.7	7.130
11	2 57 49.20	2.3957	16 01 19.6	7.032
12	3 00 13.04	2.3989	16 08 18.6	6.933
13	3 02 37.07	2.4021	16 15 11.6	6.833
14	3 05 01.29	2.4052	16 21 58.6	6.732
15	3 07 25.70	2.4084	16 28 39.5	6.631
16	3 09 50.30	2.4115	16 35 14.3	6.528
17	3 12 15.08	2.4146	16 41 42.9	6.424
18	3 14 40.05	2.4177	16 48 05.2	6.320
19	3 17 05.20	2.4207	16 54 21.3	6.215
20	3 19 30.53	2.4237	17 00 31.0	6.108
21	3 21 56.04	2.4266	17 06 34.3	6.001
22	3 24 21.72	2.4294	17 12 31.1	5.892
23	3 26 47.57	2.4323	17 18 21.4	5.784
24	3 29 13.60	+ 2.4352	N.17 24 05.2	+ 5.675

SATURDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 29 13.60	+ 2.4352	N.17 24 05.2	+ 5.675
1	3 31 39.80	2.4381	17 29 42.4	5.564
2	3 34 06.17	2.4408	17 35 12.9	5.452
3	3 36 32.70	2.4436	17 40 36.7	5.341
4	3 38 59.40	2.4463	17 45 53.8	5.228
5	3 41 26.26	2.4489	17 51 04.1	5.115
6	3 43 53.27	2.4515	17 56 07.6	5.001
7	3 46 20.44	2.4542	18 01 04.2	4.885
8	3 48 47.77	2.4567	18 05 53.8	4.769
9	3 51 15.24	2.4591	18 10 36.5	4.653
10	3 53 42.86	2.4615	18 15 12.2	4.537
11	3 56 10.62	2.4638	18 19 40.9	4.418
12	3 58 38.52	2.4662	18 24 02.4	4.299
13	4 01 06.56	2.4685	18 28 16.8	4.181
14	4 03 34.74	2.4707	18 32 24.1	4.062
15	4 06 03.05	2.4728	18 36 24.2	3.941
16	4 08 31.48	2.4749	18 40 17.0	3.819
17	4 11 00.04	2.4770	18 44 02.5	3.697
18	4 13 28.72	2.4789	18 47 40.7	3.576
19	4 15 57.51	2.4808	18 51 11.6	3.453
20	4 18 26.42	2.4827	18 54 35.1	3.330
21	4 20 55.44	2.4845	18 57 51.2	3.207
22	4 23 24.56	2.4862	19 00 59.9	3.082
23	4 25 53.79	+ 2.4879	N.19 04 01.1	+ 2.958

SUNDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 28 23.11	+ 2.4895	N.19 06 54.9	+ 2.833
1	4 30 52.53	2.4911	19 09 41.1	2.707
2	4 33 22.04	2.4925	19 12 19.8	2.582
3	4 35 51.63	2.4938	19 14 50.9	2.455
4	4 38 21.30	2.4952	19 17 14.4	2.329
5	4 40 51.05	2.4965	19 19 30.4	2.202
6	4 43 20.88	2.4977	19 21 38.7	2.074
7	4 45 50.78	2.4988	19 23 39.3	1.946
8	4 48 20.74	2.4998	19 25 32.2	1.818
9	4 50 50.76	2.5007	19 27 17.5	1.691
10	4 53 20.83	2.5017	19 28 55.1	1.562
11	4 55 50.96	2.5026	19 30 25.0	1.433
12	4 58 21.14	2.5033	19 31 47.1	1.304
13	5 00 51.36	2.5040	19 33 01.5	1.175
14	5 03 21.62	2.5046	19 34 08.1	1.046
15	5 05 51.91	2.5051	19 35 07.0	0.917
16	5 08 22.23	2.5056	19 35 58.1	0.787
17	5 10 52.58	2.5059	19 36 41.4	0.657
18	5 13 22.94	2.5062	19 37 16.9	0.527
19	5 15 53.32	2.5064	19 37 44.6	0.397
20	5 18 23.71	2.5066	19 38 04.6	0.267
21	5 20 54.11	2.5067	19 38 16.7	0.137
22	5 23 24.51	2.5067	19 38 21.1	+ 0.007
23	5 25 54.91	2.5065	19 38 17.6	− 0.122
24	5 28 25.29	+ 2.5062	N.19 38 06.4	− 0.252

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 17.					**WEDNESDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 28 25.29	+ 2.5062	N.19 38 06.4	− 0.252	0	7 27 05.61	+ 2.4127	N.17 01 55.6	− 6.048
1	5 30 55.66	2.5061	19 37 47.3	0.382	1	7 29 30.27	2.4093	16 55 49.6	6.152
2	5 33 26.02	2.5057	19 37 20.5	0.512	2	7 31 54.73	2.4059	16 49 37.4	6.255
3	5 35 56.35	2.5052	19 36 45.9	0.642	3	7 34 18.98	2.4024	16 43 19.0	6.357
4	5 38 26.65	2.5047	19 36 03.5	0.772	4	7 36 43.02	2.3989	16 36 54.5	6.458
5	5 40 56.92	2.5042	19 35 13.3	0.901	5	7 39 06.85	2.3953	16 30 24.0	6.557
6	5 43 27.16	2.5036	19 34 15.4	1.030	6	7 41 30.46	2.3917	16 23 47.6	6.657
7	5 45 57.35	2.5028	19 33 09.7	1.159	7	7 43 53.86	2.3882	16 17 05.2	6.756
8	5 48 27.50	2.5021	19 31 56.3	1.288	8	7 46 17.05	2.3846	16 10 16.9	6.852
9	5 50 57.60	2.5012	19 30 35.1	1.417	9	7 48 40.01	2.3808	16 03 22.9	6.948
10	5 53 27.64	2.5002	19 29 06.2	1.546	10	7 51 02.75	2.3772	15 56 23.1	7.044
11	5 55 57.62	2.4991	19 27 29.6	1.673	11	7 53 25.27	2.3735	15 49 17.6	7.138
12	5 58 27.53	2.4980	19 25 45.4	1.801	12	7 55 47.57	2.3697	15 42 06.5	7.231
13	6 00 57.38	2.4968	19 23 53.5	1.929	13	7 58 09.64	2.3660	15 34 49.9	7.322
14	6 03 27.15	2.4955	19 21 53.9	2.057	14	8 00 31.49	2.3622	15 27 27.8	7.413
15	6 05 56.84	2.4942	19 19 46.7	2.183	15	8 02 53.11	2.3584	15 20 00.3	7.503
16	6 08 26.45	2.4927	19 17 31.9	2.310	16	8 05 14.50	2.3545	15 12 27.4	7.592
17	6 10 55.97	2.4912	19 15 09.5	2.436	17	8 07 35.65	2.3506	15 04 49.2	7.680
18	6 13 25.40	2.4897	19 12 39.6	2.561	18	8 09 56.57	2.3467	14 57 05.8	7.766
19	6 15 54.74	2.4881	19 10 02.2	2.687	19	8 12 17.26	2.3429	14 49 17.3	7.851
20	6 18 23.97	2.4863	19 07 17.2	2.812	20	8 14 37.72	2.3390	14 41 23.7	7.936
21	6 20 53.10	2.4846	19 04 24.8	2.936	21	8 16 57.94	2.3350	14 33 25.0	8.019
22	6 23 22.12	2.4827	19 01 24.9	3.060	22	8 19 17.92	2.3311	14 25 21.4	8.101
23	6 25 51.03	+ 2.4808	N.18 58 17.6	− 3.183	23	8 21 37.67	+ 2.3271	N.14 17 12.9	− 8.182
	TUESDAY 18.					**THURSDAY 20.**			
0	6 28 19.82	+ 2.4788	N.18 55 02.9	− 3.306	0	8 23 57.17	+ 2.3231	N.14 08 59.5	− 8.262
1	6 30 48.49	2.4767	18 51 40.9	3.428	1	8 26 16.44	2.3192	14 00 41.4	8.340
2	6 33 17.03	2.4746	18 48 11.5	3.550	2	8 28 35.47	2.3152	13 52 18.7	8.417
3	6 35 45.44	2.4724	18 44 34.9	3.671	3	8 30 54.26	2.3112	13 43 51.3	8.494
4	6 38 13.72	2.4702	18 40 51.0	3.792	4	8 33 12.81	2.3072	13 35 19.4	8.569
5	6 40 41.86	2.4678	18 36 59.9	3.912	5	8 35 31.12	2.3032	13 26 43.0	8.643
6	6 43 09.86	2.4655	18 33 01.6	4.030	6	8 37 49.19	2.2992	13 18 02.2	8.717
7	6 45 37.72	2.4631	18 28 56.3	4.148	7	8 40 07.02	2.2952	13 09 17.0	8.789
8	6 48 05.43	2.4605	18 24 43.8	4.267	8	8 42 24.61	2.2912	13 00 27.5	8.859
9	6 50 32.98	2.4579	18 20 24.2	4.384	9	8 44 41.95	2.2871	12 51 33.9	8.928
10	6 53 00.38	2.4552	18 15 57.7	4.500	10	8 46 59.06	2.2831	12 42 36.1	8.997
11	6 55 27.61	2.4525	18 11 24.2	4.617	11	8 49 15.93	2.2792	12 33 34.3	9.063
12	6 57 54.68	2.4498	18 06 43.7	4.732	12	8 51 32.56	2.2752	12 24 28.5	9.129
13	7 00 21.59	2.4470	18 01 56.4	4.846	13	8 53 48.95	2.2712	12 15 18.8	9.194
14	7 02 48.32	2.4441	17 57 02.2	4.959	14	8 56 05.10	2.2672	12 06 05.2	9.257
15	7 05 14.88	2.4412	17 52 01.3	5.072	15	8 58 21.01	2.2632	11 56 47.9	9.319
16	7 07 41.26	2.4382	17 46 53.6	5.184	16	9 00 36.68	2.2592	11 47 26.9	9.381
17	7 10 07.47	2.4352	17 41 39.2	5.295	17	9 02 52.11	2.2552	11 38 02.2	9.441
18	7 12 33.49	2.4321	17 36 18.2	5.405	18	9 05 07.30	2.2512	11 28 34.0	9.499
19	7 14 59.32	2.4290	17 30 50.6	5.514	19	9 07 22.26	2.2473	11 19 02.3	9.557
20	7 17 24.97	2.4258	17 25 16.5	5.622	20	9 09 36.98	2.2433	11 09 27.2	9.613
21	7 19 50.42	2.4226	17 19 35.9	5.731	21	9 11 51.46	2.2394	10 59 48.7	9.669
22	7 22 15.68	2.4194	17 13 48.8	5.837	22	9 14 05.71	2.2355	10 50 06.9	9.723
23	7 24 40.75	2.4161	17 07 55.4	5.943	23	9 16 19.72	2.2316	10 40 21.9	9.776
24	7 27 05.61	+ 2.4127	N.17 01 55.6	− 6.048	24	9 18 33.50	+ 2.2277	N.10 30 33.8	− 9.827

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	9 18 33.50	+ 2.2277	N.10 30 33.8	− 9.827
1	9 20 47.05	2.2239	10 20 42.6	9.877
2	9 23 00.37	2.2200	10 10 48.5	9.927
3	9 25 13.45	2.2162	10 00 51.4	9.976
4	9 27 26.31	2.2123	9 50 51.4	10.022
5	9 29 38.93	2.2085	9 40 48.7	10.068
6	9 31 51.33	2.2048	9 30 43.2	10.113
7	9 34 03.51	2.2011	9 20 35.1	10.157
8	9 36 15.46	2.1972	9 10 24.4	10.199
9	9 38 27.18	2.1935	9 00 11.2	10.241
10	9 40 38.68	2.1898	8 49 55.5	10.281
11	9 42 49.96	2.1862	8 39 37.5	10.319
12	9 45 01.03	2.1827	8 29 17.2	10.357
13	9 47 11.88	2.1790	8 18 54.7	10.393
14	9 49 22.51	2.1753	8 08 30.0	10.429
15	9 51 32.92	2.1717	7 58 03.2	10.463
16	9 53 43.12	2.1682	7 47 34.4	10.497
17	9 55 53.11	2.1647	7 37 03.6	10.529
18	9 58 02.89	2.1612	7 26 30.9	10.560
19	10 00 12.46	2.1578	7 15 56.4	10.590
20	10 02 21.83	2.1544	7 05 20.1	10.618
21	10 04 30.99	2.1510	6 54 42.2	10.646
22	10 06 39.95	2.1476	6 44 02.6	10.672
23	10 08 48.70	+ 2.1442	N. 6 33 21.5	−10.697

SATURDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
0	10 10 57.26	+ 2.1410	N. 6 22 38.9	−10.722
1	10 13 05.62	2.1378	6 11 54.9	10.745
2	10 15 13.79	2.1345	6 01 09.5	10.767
3	10 17 21.76	2.1312	5 50 22.9	10.787
4	10 19 29.54	2.1281	5 39 35.0	10.807
5	10 21 37.13	2.1249	5 28 46.0	10.826
6	10 23 44.53	2.1218	5 17 55.9	10.844
7	10 25 51.75	2.1188	5 07 04.7	10.861
8	10 27 58.79	2.1157	4 56 12.6	10.877
9	10 30 05.64	2.1127	4 45 19.5	10.892
10	10 32 12.31	2.1097	4 34 25.6	10.904
11	10 34 18.81	2.1068	4 23 31.0	10.917
12	10 36 25.13	2.1039	4 12 35.6	10.928
13	10 38 31.28	2.1011	4 01 39.6	10.938
14	10 40 37.26	2.0982	3 50 43.0	10.948
15	10 42 43.07	2.0954	3 39 45.8	10.957
16	10 44 48.71	2.0927	3 28 48.2	10.964
17	10 46 54.19	2.0900	3 17 50.1	10.971
18	10 48 59.51	2.0873	3 06 51.7	10.976
19	10 51 04.67	2.0847	2 55 53.0	10.980
20	10 53 09.67	2.0821	2 44 54.1	10.982
21	10 55 14.52	2.0795	2 33 55.1	10.985
22	10 57 19.21	2.0769	2 22 55.9	10.987
23	10 59 23.75	2.0744	2 11 56.6	10.987
24	11 01 28.14	+ 2.0720	N. 2 00 57.4	−10.987

SUNDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	11 01 28.14	+ 2.0720	N. 2 00 57.4	−10.987
1	11 03 32.39	2.0696	1 49 58.2	10.986
2	11 05 36.49	2.0672	1 38 59.1	10.983
3	11 07 40.46	2.0649	1 28 00.2	10.979
4	11 09 44.28	2.0526	1 17 01.6	10.975
5	11 11 47.97	2.0603	1 06 03.2	10.971
6	11 13 51.52	2.0581	0 55 05.1	10.964
7	11 15 54.94	2.0559	0 44 07.5	10.957
8	11 17 58.23	2.0537	0 33 10.3	10.949
9	11 20 01.39	2.0517	0 22 13.6	10.940
10	11 22 04.43	2.0497	0 11 17.5	10.930
11	11 24 07.35	2.0476	N. 0 00 22.0	10.920
12	11 26 10.14	2.0456	S. 0 10 32.9	10.908
13	11 28 12.82	2.0437	0 21 27.0	10.896
14	11 30 15.38	2.0417	0 32 20.4	10.882
15	11 32 17.83	2.0398	0 43 12.9	10.868
16	11 34 20.16	2.0380	0 54 04.6	10.853
17	11 36 22.39	2.0362	1 04 55.3	10.837
18	11 38 24.51	2.0345	1 15 45.1	10.821
19	11 40 26.53	2.0328	1 26 33.8	10.803
20	11 42 28.45	2.0312	1 37 21.5	10.786
21	11 44 30.27	2.0295	1 48 08.1	10.767
22	11 46 31.99	2.0278	1 58 53.5	10.746
23	11 48 33.61	+ 2.0263	S. 2 09 37.6	−10.725

MONDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
0	11 50 35.15	+ 2.0248	S. 2 20 20.5	−10.704
1	11 52 36.59	2.0233	2 31 02.1	10.682
2	11 54 37.95	2.0219	2 41 42.3	10.658
3	11 56 39.22	2.0205	2 52 21.1	10.634
4	11 58 40.41	2.0192	3 02 58.4	10.609
5	12 00 41.52	2.0179	3 13 34.2	10.584
6	12 02 42.56	2.0166	3 24 08.5	10.558
7	12 04 43.51	2.0153	3 34 41.2	10.531
8	12 06 44.39	2.0142	3 45 12.2	10.503
9	12 08 45.21	2.0130	3 55 41.6	10.475
10	12 10 45.95	2.0118	4 06 09.2	10.445
11	12 12 46.63	2.0107	4 16 35.0	10.415
12	12 14 47.24	2.0097	4 26 59.0	10.385
13	12 16 47.79	2.0087	4 37 21.2	10.353
14	12 18 48.28	2.0077	4 47 41.4	10.321
15	12 20 48.71	2.0067	4 57 59.7	10.288
16	12 22 49.09	2.0059	5 08 16.0	10.254
17	12 24 49.42	2.0050	5 18 30.2	10.220
18	12 26 49.69	2.0041	5 28 42.4	10.186
19	12 28 49.91	2.0033	5 38 52.5	10.150
20	12 30 50.09	2.0026	5 49 00.4	10.113
21	12 32 50.22	2.0018	5 59 06.1	10.077
22	12 34 50.31	2.0012	6 09 09.6	10.039
23	12 36 50.36	2.0005	6 19 10.8	10.001
24	12 38 50.37	+ 1.9999	S. 6 29 09.7	− 9.962

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 25.					**THURSDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 38 50.37	+ 1.9999	S. 6 29 09.7	− 9.962	0	14 14 44.08	+ 2.0066	S.13 31 11.8	− 7.417
1	12 40 50.35	1.9993	6 39 06.2	9.922	1	14 16 44.50	2.0074	13 38 34.9	7.352
2	12 42 50.29	1.9987	6 49 00.3	9.882	2	14 18 44.97	2.0082	13 45 54.1	7.287
3	12 44 50.20	1.9982	6 58 52.0	9.841	3	14 20 45.49	2.0091	13 53 09.3	7.221
4	12 46 50.08	1.9977	7 08 41.2	9.799	4	14 22 46.06	2.0099	14 00 20.6	7.154
5	12 48 49.93	1.9973	7 18 27.9	9.757	5	14 24 46.68	2.0107	14 07 27.8	7.087
6	12 50 49.76	1.9969	7 28 12.1	9.715	6	14 26 47.35	2.0116	14 14 31.0	7.020
7	12 52 49.56	1.9966	7 37 53.7	9.671	7	14 28 48.07	2.0125	14 21 30.2	6.952
8	12 54 49.35	1.9962	7 47 32.6	9.627	8	14 30 48.85	2.0134	14 28 25.3	6.884
9	12 56 49.11	1.9959	7 57 08.9	9.582	9	14 32 49.68	2.0142	14 35 16.3	6.815
10	12 58 48.86	1.9957	8 06 42.5	9.537	10	14 34 50.56	2.0152	14 42 03.1	6.746
11	13 00 48.59	1.9953	8 16 13.3	9.491	11	14 36 51.50	2.0162	14 48 45.8	6.677
12	13 02 48.30	1.9951	8 25 41.4	9.445	12	14 38 52.50	2.0172	14 55 24.3	6.607
13	13 04 48.00	1.9950	8 35 06.7	9.397	13	14 40 53.56	2.0181	15 01 58.6	6.537
14	13 06 47.70	1.9948	8 44 29.1	9.350	14	14 42 54.67	2.0191	15 08 28.7	6.467
15	13 08 47.38	1.9947	8 53 48.7	9.302	15	14 44 55.85	2.0202	15 14 54.6	6.396
16	13 10 47.06	1.9947	9 03 05.4	9.253	16	14 46 57.09	2.0212	15 21 16.2	6.323
17	13 12 46.74	1.9946	9 12 19.1	9.204	17	14 48 58.39	2.0222	15 27 33.4	6.252
18	13 14 46.41	1.9946	9 21 29.9	9.155	18	14 50 59.75	2.0232	15 33 46.4	6.180
19	13 16 46.09	1.9946	9 30 37.7	9.104	19	14 53 01.17	2.0242	15 39 55.0	6.107
20	13 18 45.76	1.9946	9 39 42.4	9.053	20	14 55 02.66	2.0253	15 45 59.2	6.034
21	13 20 45.44	1.9947	9 48 44.1	9.002	21	14 57 04.21	2.0264	15 51 59.1	5.962
22	13 22 45.13	1.9948	9 57 42.6	8.949	22	14 59 05.83	2.0275	15 57 54.6	5.887
23	13 24 44.82	+ 1.9949	S.10 06 38.0	− 8.897	23	15 01 07.51	+ 2.0286	S.16 03 45.6	− 5.812
	WEDNESDAY 26.					**FRIDAY 28.**			
0	13 26 44.52	+ 1.9951	S.10 15 30.2	− 8.843	0	15 03 09.26	+ 2.0297	S.16 09 32.1	− 5.738
1	13 28 44.23	1.9952	10 24 19.2	8.790	1	15 05 11.08	2.0308	16 15 14.2	5.664
2	13 30 43.95	1.9955	10 33 05.0	8.736	2	15 07 12.96	2.0320	16 20 51.8	5.588
3	13 32 43.69	1.9957	10 41 47.5	8.681	3	15 09 14.92	2.0332	16 26 24.8	5.512
4	13 34 43.44	1.9960	10 50 26.7	8.626	4	15 11 16.94	2.0343	16 31 53.3	5.437
5	13 36 43.21	1.9963	10 59 02.6	8.570	5	15 13 19.03	2.0355	16 37 17.3	5.362
6	13 38 43.00	1.9967	11 07 35.1	8.513	6	15 15 21.20	2.0367	16 42 36.7	5.285
7	13 40 42.81	1.9970	11 16 04.2	8.457	7	15 17 23.43	2.0378	16 47 51.5	5.207
8	13 42 42.64	1.9973	11 24 29.9	8.400	8	15 19 25.74	2.0390	16 53 01.6	5.130
9	13 44 42.49	1.9977	11 32 52.2	8.342	9	15 21 28.11	2.0402	16 58 07.1	5.053
10	13 46 42.37	1.9982	11 41 11.0	8.284	10	15 23 30.56	2.0414	17 03 08.0	4.975
11	13 48 42.27	1.9986	11 49 26.3	8.225	11	15 25 33.08	2.0426	17 08 04.1	4.897
12	13 50 42.20	1.9991	11 57 38.0	8.165	12	15 27 35.67	2.0438	17 12 55.6	4.818
13	13 52 42.16	1.9996	12 05 46.1	8.105	13	15 29 38.34	2.0451	17 17 42.3	4.739
14	13 54 42.15	2.0002	12 13 50.6	8.045	14	15 31 41.08	2.0462	17 22 24.3	4.660
15	13 56 42.18	2.0007	12 21 51.5	7.985	15	15 33 43.89	2.0474	17 27 01.5	4.581
16	13 58 42.24	2.0012	12 29 48.8	7.924	16	15 35 46.77	2.0487	17 31 34.0	4.502
17	14 00 42.33	2.0018	12 37 42.4	7.862	17	15 37 49.73	2.0499	17 36 01.7	4.421
18	14 02 42.46	2.0025	12 45 32.2	7.799	18	15 39 52.76	2.0512	17 40 24.5	4.340
19	14 04 42.63	2.0032	12 53 18.3	7.737	19	15 41 55.87	2.0524	17 44 42.5	4.259
20	14 06 42.84	2.0038	13 01 00.7	7.674	20	15 43 59.05	2.0536	17 48 55.6	4.178
21	14 08 43.09	2.0045	13 08 39.2	7.610	21	15 46 02.30	2.0548	17 53 03.9	4.097
22	14 10 43.38	2.0052	13 16 13.9	7.547	22	15 48 05.63	2.0562	17 57 07.3	4.016
23	14 12 43.71	2.0058	13 23 44.8	7.482	23	15 50 09.04	2.0573	18 01 05.8	3.933
24	14 14 44.08	+ 2.0066	S.13 31 11.8	− 7.417	24	15 52 12.51	+ 2.0585	S.18 04 59.3	− 3.851

GREENWICH MEAN TIME.

PHASES OF THE MOON.

		d	h	m
● New Moon	Feb.	8	01	21.5
☽ First Quarter		15	02	56.6
○ Full Moon		22	01	03.4

		d	h
☾ Apogee	Feb.	1	11.6
☾ Perigee		16	06.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Noon.	P.L. of Diff.	IIIʰ.	P.L. of Diff.	VIʰ.	P.L. of Diff.	IXʰ.	P.L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Pollux	W.	119 44 23	3193	121 10 40	3198	122 36 52	3202	124 2 59	3207
	Regulus	W.	83 30 53	3091	84 59 13	3093	86 27 31	3093	87 55 49	3092
	Spica	W.	29 41 17	3076	31 09 56	3075	32 38 36	3075	34 07 16	3075
	Saturn	E.	59 23 39	3136	57 56 13	3137	56 28 48	3138	55 01 25	3138
	Sun	E.	79 43 15	3482	78 22 31	3484	77 01 49	3484	75 41 07	3483
2	Regulus	W.	95 17 37	3085	96 46 5	3082	98 14 37	3078	99 43 13	3074
	Spica	W.	41 30 49	3067	42 59 39	3064	44 28 32	3060	45 57 30	3056
	Saturn	E.	47 44 28	3135	46 17 01	3134	44 49 33	3132	43 22 02	3130
	Sun	E.	68 57 24	3476	67 36 33	3473	66 15 40	3470	64 54 42	3466
3	Regulus	W.	107 07 31	3051	108 36 41	3044	110 05 59	3038	111 35 24	3031
	Spica	W.	53 23 42	3031	54 53 16	3025	56 22 58	3018	57 52 49	3011
	Saturn	E.	36 03 42	3115	34 35 51	3113	33 07 57	3110	31 39 59	3108
	Sun	E.	58 08 40	3440	56 47 09	3434	55 25 32	3428	54 03 47	3422
4	Regulus	W.	119 04 42	2994	120 35 02	2986	122 05 32	2977	123 36 13	2969
	Spica	W.	65 24 21	2971	66 55 10	2962	68 26 10	2953	69 57 22	2943
	Antares	W.	20 59 05	3224	22 24 46	3185	23 51 13	3150	25 18 22	3119
	Sun	E.	47 13 01	3383	45 50 25	3375	44 27 40	3366	43 04 45	3358
5	Spica	W.	77 36 27	2893	79 08 56	2882	80 41 37	2871	82 14 33	2860
	Antares	W.	32 42 20	3003	34 12 29	2984	35 43 02	2965	37 13 58	2948
	Sun	E.	36 07 42	3314	34 43 47	3307	33 19 43	3300	31 55 32	3292
6	Spica	W.	90 02 46	2804	91 37 09	2792	93 11 47	2781	94 46 40	2769
	Antares	W.	44 53 55	2869	46 26 54	2854	48 00 12	2839	49 33 49	2825
9	α Arietis	E.	64 30 18	2621	62 51 51	2613	61 13 14	2606	59 34 27	2601
	Aldebaran	E.	97 24 29	2545	95 44 19	2537	94 03 57	2528	92 23 22	2519
10	Sun	W.	24 21 55	2899	25 54 15	2882	27 26 58	2866	29 00 01	2851
	α Arietis	E.	51 18 54	2580	49 39 32	2579	48 00 08	2577	46 20 42	2577
	Aldebaran	E.	83 57 26	2477	82 15 41	2470	80 33 45	2462	78 51 38	2455
	Pollux	E.	126 00 20	2604	124 21 31	2593	122 42 26	2580	121 03 04	2569
11	Sun	W.	36 49 34	2792	38 24 12	2783	39 59 02	2774	41 34 04	2765
	Aldebaran	E.	70 18 39	2422	68 35 36	2416	66 52 24	2410	65 09 04	2405
	Pollux	E.	112 42 29	2520	111 01 43	2511	109 20 45	2503	107 39 36	2495
12	Sun	W.	49 31 52	2729	51 07 53	2723	52 44 02	2717	54 20 19	2712
	α Pegasi	W.	26 16 52	3345	27 40 11	3234	29 05 40	3138	30 33 04	3056
	Aldebaran	E.	56 30 35	2381	54 46 33	2377	53 02 25	2373	51 18 11	2369
	Pollux	E.	99 11 23	2464	97 29 19	2459	95 47 08	2453	94 04 49	2449
13	Sun	W.	62 23 27	2688	64 00 24	2684	65 37 26	2679	67 14 34	2675
	α Pegasi	W.	38 10 50	2792	39 45 29	2756	41 20 55	2725	42 57 02	2697
	Aldebaran	E.	42 35 45	2353	40 51 03	2350	39 06 17	2348	37 21 28	2346
	Pollux	E.	85 31 48	2431	83 48 57	2429	82 06 03	2426	80 23 05	2423

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVʰ.	P. L. of Diff.	XVIIIʰ.	P. L. of Diff.	XXIʰ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Pollux	W.	125 29 00	3211	126 54 56	3215	128 20 47	3220	129 46 33	3224
	Regulus	W.	89 24 08	3091	90 52 28	3091	92 20 48	3089	93 49 11	3087
	Spica	W.	35 35 56	3075	37 04 36	3673	38 33 18	3071	40 02 02	3069
	SATURN	E.	53 34 02	3139	52 06 40	3138	50 39 17	3138	49 11 53	3137
	SUN	E.	74 20 24	3483	72 59 41	3482	71 38 58	3480	70 18 12	3479
2	Regulus	W.	101 11 54	3071	102 40 39	3066	104 09 30	3060	105 38 28	3056
	Spica	W.	47 26 33	3052	48 55 41	3047	50 24 55	3043	51 54 15	3037
	SATURN	E.	41 54 29	3127	40 26 52	3124	38 59 12	3122	37 31 29	3119
	SUN	E.	63 33 40	3462	62 12 34	3457	60 51 22	3452	59 30 04	3446
3	Regulus	W.	113 04 58	3025	114 34 40	3018	116 04 31	3009	117 34 32	3002
	Spica	W.	59 22 48	3004	60 52 56	2996	62 23 14	2988	63 53 42	2980
	SATURN	E.	30 11 59	3105	28 43 56	3104	27 15 51	3102	25 47 44	3101
	SUN	E.	52 41 55	3414	51 19 54	3407	49 57 45	3400	48 35 28	3391
4	Regulus	W.	125 07 04	2961	126 38 06	2952	128 09 19	2942	129 40 44	2933
	Spica	W.	71 28 46	2934	73 00 22	2924	74 32 11	2914	76 04 12	2903
	Antares	W.	26 46 09	3091	28 14 29	3067	29 43 19	3044	31 12 37	3024
	SUN	E.	41 41 40	3349	40 18 25	3341	38 55 01	3332	37 31 27	3323
5	Spica	W.	83 47 43	2849	85 21 07	2838	86 54 45	2827	88 28 38	2815
	Antares	W.	38 45 16	2931	40 16 55	2915	41 48 55	2899	43 21 15	2883
	SUN	E.	30 31 11	3283	29 06 40	3276	27 42 01	3274	26 17 19	3274
6	Spica	W.	96 21 49	2757	97 57 13	2746	99 32 52	2735	101 08 46	2722
	Antares	W.	51 07 45	2811	52 41 59	2798	54 16 30	2784	55 51 20	2770
9	a Arietis	E.	57 55 33	2597	56 16 34	2591	54 37 28	2586	52 58 14	2582
	Aldebaran	E.	90 42 35	2510	89 01 35	2502	87 20 24	2493	85 39 01	2485
10	SUN	W.	30 33 23	2838	32 07 02	2825	33 40 58	2813	35 15 09	2802
	a Arietis	E.	44 41 16	2578	43 01 51	2581	41 22 30	2584	39 43 13	2589
	Aldebaran	E.	77 09 21	2448	75 26 54	2442	73 44 19	2435	72 01 34	2428
	Pollux	E.	119 23 26	2558	117 43 33	2547	116 03 25	2537	114 23 03	2528
11	SUN	W.	43 09 18	2757	44 44 42	2750	46 20 16	2742	47 56 00	2736
	Aldebaran	E.	63 25 37	2400	61 42 02	2395	59 58 20	2390	58 14 31	2385
	Pollux	E.	105 58 16	2488	104 16 46	2482	102 35 08	2475	100 53 20	2469
12	SUN	W.	55 56 43	2707	57 33 14	2702	59 09 52	2697	60 46 36	2692
	a Pegasi	W.	32 02 07	2988	33 32 35	2930	35 04 16	2878	36 37 03	2831
	Aldebaran	E.	49 33 52	2365	47 49 27	2362	46 04 58	2359	44 20 24	2356
	Pollux	E.	92 22 24	2445	90 39 53	2441	88 57 17	2437	87 14 35	2433
13	SUN	W.	68 51 47	2672	70 29 05	2668	72 06 28	2665	73 43 55	2661
	a Pegasi	W.	44 33 46	2672	46 11 04	2649	47 48 52	2629	49 27 07	2610
	Aldebaran	E.	35 36 36	2345	33 51 42	2344	32 06 46	2343	30 21 48	2342
	Pollux	E.	78 40 03	2422	76 56 59	2420	75 13 53	2419	73 30 45	2417

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
13	Regulus	E.	122 12 03	2366	120 27 39	2361	118 43 08	2357	116 58 31	2353
14	Sun	W.	75 21 27	2658	76 59 03	2656	78 36 42	2653	80 14 25	2650
	α Pegasi	W.	51 05 48	2593	52 44 52	2579	54 24 16	2565	56 03 59	2553
	Pollux	E.	71 47 35	2417	70 04 25	2417	68 21 15	2417	66 38 05	2418
	Regulus	E.	108 14 12	2337	106 29 07	2334	104 43 57	2331	102 58 43	2329
15	Sun	W.	88 23 51	2640	90 01 52	2638	91 39 56	2636	93 18 02	2634
	α Pegasi	W.	64 26 22	2505	66 07 28	2498	67 48 44	2491	69 30 10	2485
	Pollux	E.	58 02 41	2428	56 19 46	2432	54 36 57	2436	52 54 14	2442
	Regulus	E.	94 11 46	2319	92 26 14	2317	90 40 40	2315	88 55 03	2314
16	Sun	W.	101 29 01	2629	103 07 16	2629	104 45 32	2628	106 23 49	2628
	α Pegasi	W.	77 59 02	2465	79 41 04	2463	81 23 09	2460	83 05 18	2459
	α Arietis	W.	34 21 51	2491	36 03 17	2475	37 45 05	2461	39 27 14	2448
	Pollux	E.	44 22 58	2484	42 41 22	2497	41 00 04	2511	39 19 06	2527
	Regulus	E.	80 06 34	2310	78 20 49	2309	76 35 04	2309	74 49 18	2309
	Spica	E.	133 51 26	2292	132 05 15	2291	130 19 03	2291	128 32 50	2291
17	Sun	W.	114 35 10	2630	116 13 24	2632	117 51 36	2633	119 29 47	2634
	α Pegasi	W.	91 36 22	2458	93 18 34	2459	95 00 45	2461	96 42 53	2463
	α Arietis	W.	48 01 46	2406	49 45 13	2401	51 28 47	2396	53 12 28	2392
	Regulus	E.	66 00 33	2312	64 14 51	2313	62 29 11	2315	60 43 33	2317
	Spica	E.	119 41 43	2291	117 55 30	2292	116 09 19	2292	114 23 08	2294
18	α Pegasi	W.	105 12 29	2483	106 54 06	2489	108 35 35	2495	110 16 55	2502
	α Arietis	W.	61 51 51	2384	63 35 49	2383	65 19 48	2384	67 03 46	2384
	Aldebaran	W.	28 12 26	2324	29 57 51	2324	31 43 16	2324	33 28 40	2326
	Regulus	E.	51 56 14	2331	50 10 59	2335	48 25 50	2339	46 40 47	2343
	Spica	E.	105 32 44	2302	103 46 47	2304	102 00 54	2307	100 15 04	2309
19	α Arietis	W.	75 43 06	2396	77 26 47	2399	79 10 23	2403	80 53 53	2408
	Aldebaran	W.	42 14 58	2338	44 00 02	2342	45 45 00	2346	47 29 52	2350
	Regulus	E.	37 57 30	2376	36 13 21	2385	34 29 25	2394	32 45 42	2405
	Spica	E.	91 27 04	2327	89 41 44	2332	87 56 32	2337	86 11 26	2342
20	α Arietis	W.	89 29 39	2436	91 12 22	2443	92 54 56	2450	94 37 19	2458
	Aldebaran	W.	56 12 27	2378	57 56 33	2385	59 40 29	2392	61 24 16	2399
	Spica	E.	77 27 54	2371	75 43 38	2378	73 59 32	2385	72 15 36	2393
	Antares	E.	122 45 53	2419	121 02 45	2424	119 19 44	2429	117 36 51	2436
21	α Arietis	W.	103 06 20	2503	104 47 29	2514	106 28 23	2524	108 09 03	2535
	Aldebaran	W.	70 00 26	2440	71 43 04	2449	73 25 29	2458	75 07 41	2467
	Pollux	W.	29 14 46	2812	30 48 58	2787	32 23 43	2766	33 58 55	2749
	Spica	E.	63 38 46	2434	61 56 00	2444	60 13 28	2453	58 31 09	2462
	Antares	E.	109 04 49	2472	107 22 57	2481	105 41 17	2489	103 59 49	2498
22	Aldebaran	W.	83 35 12	2520	85 15 57	2531	86 56 27	2542	88 36 41	2553
	Pollux	W.	41 59 00	2713	43 35 23	2712	45 11 47	2713	46 48 10	2716
	Spica	E.	50 03 06	2516	48 22 15	2527	46 41 39	2538	45 01 19	2550
	Antares	E.	95 35 50	2550	93 55 46	2561	92 15 57	2572	90 36 24	2583

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVʰ.	P. L. of Diff.	XVIIIʰ.	P. L. of Diff.	XXIʰ.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
13	Regulus E.	115 13 49	2350	113 29 02	2346	111 44 10	2343	109 59 13	2340
14	Sun W.	81 52 12	2648	83 30 02	2646	85 07 55	2643	86 45 52	2641
	a Pegasi W.	57 43 59	2542	59 24 14	2531	61 04 44	2522	62 45 27	2513
	Pollux E.	64 54 56	2419	63 11 48	2421	61 28 43	2422	59 45 40	2425
	Regulus E.	101 13 26	2327	99 28 06	2324	97 42 42	2322	95 57 15	2321
15	Sun W.	94 56 11	2633	96 34 21	2632	98 12 33	2631	99 50 46	2630
	a Pegasi W.	71 11 44	2480	72 53 24	2476	74 35 11	2472	76 17 04	2468
	Pollux E.	51 11 39	2448	49 29 13	2455	47 46 56	2463	46 04 50	2472
	Regulus E.	87 09 24	2313	85 23 43	2313	83 38 02	2311	81 52 19	2310
16	Sun W.	108 02 06	2628	109 40 23	2629	111 18 39	2629	112 56 55	2629
	a Pegasi W.	84 47 29	2458	86 29 42	2458	88 11 55	2457	89 54 09	2458
	a Arietis W.	41 09 41	2436	42 52 24	2427	44 35 20	2419	46 18 28	2412
	Pollux E.	37 38 31	2548	35 58 24	2572	34 18 50	2598	32 39 52	2626
	Regulus E.	73 03 32	2309	71 17 46	2310	69 32 01	2310	67 46 16	2311
	Spica E.	126 46 37	2291	125 00 24	2290	123 14 10	2290	121 27 56	2291
17	Sun W.	121 07 56	2635	122 46 03	2638	124 24 07	2640	126 02 08	2642
	a Pegasi W.	98 24 58	2466	100 06 59	2470	101 48 55	2474	103 30 45	2478
	a Arietis W.	54 56 14	2389	56 40 04	2387	58 23 57	2385	60 07 53	2384
	Regulus E.	58 57 58	2319	57 12 26	2322	55 26 58	2324	53 41 34	2327
	Spica E.	112 36 59	2295	110 50 52	2296	109 04 47	2298	107 18 44	2300
18	a Pegasi W.	111 58 05	2511	113 39 03	2520	115 19 48	2529	117 00 21	2539
	a Arietis W.	68 47 43	2386	70 31 38	2387	72 15 31	2390	73 59 20	2393
	Aldebaran W.	35 14 02	2328	36 59 21	2330	38 44 37	2333	40 29 49	2335
	Regulus E.	44 55 50	2348	43 11 01	2354	41 26 21	2361	39 41 50	2368
	Spica E.	98 29 18	2313	96 43 37	2316	94 58 01	2320	93 12 30	2323
19	a Arietis W.	82 37 17	2412	84 20 34	2417	86 03 44	2423	87 46 46	2429
	Aldebaran W.	49 14 38	2355	50 59 17	2361	52 43 48	2366	54 28 12	2372
	Regulus E.	31 02 14	2417	29 19 04	2431	27 36 14	2446	25 53 45	2463
	Spica E.	84 26 27	2347	82 41 36	2353	80 56 54	2359	79 12 20	2364
20	a Arietis W.	96 19 32	2466	98 01 33	2475	99 43 21	2484	101 24 57	2493
	Aldebaran W.	63 07 52	2406	64 51 18	2414	66 34 32	2422	68 17 35	2431
	Spica E.	70 31 51	2401	68 48 17	2409	67 04 55	2417	65 21 44	2426
	Antares E.	115 54 07	2443	114 11 33	2449	112 29 08	2456	110 46 53	2464
21	a Arietis W.	109 49 27	2547	111 29 35	2559	113 09 26	2572	114 49 00	2584
	Aldebaran W.	76 49 40	2477	78 31 25	2488	80 12 55	2498	81 54 11	2509
	Pollux W.	35 34 30	2736	37 10 22	2726	38 46 27	2720	40 22 41	2716
	Spica E.	56 49 03	2473	55 07 12	2483	53 25 35	2494	51 44 13	2504
	Antares E.	102 18 33	2508	100 37 31	2519	98 56 44	2528	97 16 10	2538
22	Aldebaran W.	90 16 40	2566	91 56 22	2578	93 35 47	2590	95 14 56	2602
	Pollux W.	48 24 29	2719	50 00 43	2724	51 36 51	2729	53 12 53	2735
	Spica E.	43 21 15	2561	41 41 27	2574	40 01 57	2586	38 22 43	2598
	Antares E.	88 57 06	2596	87 18 05	2608	85 39 21	2620	84 00 53	2632

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LUNAR DISTANCES.

Day of the Month	Name and Direction of Object	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Aldebaran W.	96 53 48	2615	98 32 23	2628	100 10 40	2640	101 48 41	2653
	Pollux W.	54 48 46	2743	56 24 29	2750	58 00 03	2758	59 35 26	2766
	Spica E.	36 43 45	2611	35 05 05	2624	33 26 43	2636	31 48 37	2649
	Antares E.	82 22 42	2645	80 44 49	2658	79 07 13	2671	77 29 54	2684
	SATURN E.	127 54 28	2667	126 17 04	2678	124 39 55	2690	123 03 02	2703
	a Aquilæ E.	130 08 45	3332	128 45 10	3312	127 21 12	3296	125 56 56	3283
24	Aldebaran W.	109 54 23	2718	111 30 39	2732	113 06 37	2744	114 42 19	2756
	Pollux W.	67 29 18	2816	69 03 25	2827	70 37 17	2838	72 10 56	2849
	Regulus W.	30 29 17	2779	32 04 13	2786	33 38 59	2794	35 13 35	2802
	Spica E.	23 42 34	2716	22 06 15	2729	20 30 13	2742	18 54 29	2756
	Antares E.	69 27 50	2753	67 52 20	2767	66 17 09	2780	64 42 15	2795
	SATURN E.	115 02 44	2765	113 27 30	2777	111 52 32	2789	110 17 50	2802
	a Aquilæ E.	118 52 21	3244	117 27 04	3242	116 01 44	3240	114 36 22	3240
	JUPITER E.	125 07 27	2816	123 33 20	2828	121 59 28	2840	120 25 52	2852
25	Pollux W.	79 55 28	2907	81 27 38	2919	82 59 33	2931	84 31 13	2942
	Regulus W.	43 03 34	2852	44 36 54	2862	46 10 01	2873	47 42 55	2883
	Antares E.	56 52 25	2866	55 19 22	2880	53 46 38	2894	52 14 12	2909
	SATURN E.	102 28 30	2865	100 55 26	2878	99 22 39	2890	97 50 07	2901
	a Aquilæ E.	107 30 01	3256	106 04 58	3262	104 40 02	3267	103 15 12	3274
	JUPITER E.	112 41 51	2914	111 09 50	2926	109 38 04	2938	108 06 33	2950
26	Pollux W.	92 05 56	3000	93 36 09	3010	95 06 09	3021	96 35 56	3032
	Regulus W.	55 24 05	2935	56 55 40	2945	58 27 02	2954	59 58 12	2964
	Antares E.	44 36 42	2983	43 06 08	2998	41 35 53	3014	40 05 57	3029
	SATURN E.	90 11 12	2959	88 40 08	2970	87 09 18	2981	85 38 41	2991
	a Aquilæ E.	96 13 10	3314	94 49 14	3323	93 25 29	3332	92 01 54	3340
	JUPITER E.	100 32 41	3007	99 02 37	3018	97 32 46	3028	96 03 08	3038
	SUN E.	133 06 09	3304	131 42 02	3314	130 18 07	3325	128 54 25	3336
27	Pollux W.	104 01 32	3084	105 30 01	3093	106 58 19	3103	108 26 25	3112
	Regulus W.	67 31 09	3008	69 01 12	3015	70 31 06	3023	72 00 50	3030
	Spica W.	13 39 55	2995	15 10 14	3001	16 40 25	3008	18 10 27	3014
	Antares E.	32 41 18	3115	31 13 27	3136	29 46 01	3157	28 19 00	3180
	SATURN E.	78 08 44	3039	76 39 19	3047	75 10 04	3055	73 40 59	3063
	a Aquilæ E.	85 06 46	3391	83 44 19	3401	82 22 04	3412	81 00 01	3423
	JUPITER E.	88 38 03	3086	87 09 36	3094	85 41 19	3102	84 13 12	3110
	SUN E.	121 58 50	3383	120 36 14	3392	119 13 48	3399	117 51 30	3407
28	Pollux W.	115 44 14	3155	117 11 17	3163	118 38 10	3171	120 04 54	3179
	Regulus W.	79 27 28	3060	80 56 26	3065	82 25 18	3069	83 54 05	3073
	Spica W.	25 38 42	3044	27 07 59	3049	28 37 11	3053	30 06 18	3057
	SATURN E.	66 17 50	3096	64 49 36	3101	63 21 28	3106	61 53 27	3111
	a Aquilæ E.	74 12 56	3480	72 52 10	3492	71 31 37	3505	70 11 18	3517
	JUPITER E.	76 54 47	3143	75 27 29	3148	74 00 18	3153	72 33 12	3157
	SUN E.	111 02 04	3439	109 40 32	3444	108 19 05	3449	106 57 44	3453

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
23	Aldebaran	W.	103 26 24	2666	105 03 49	2679	106 40 57	2691	108 17 49	2704
	Pollux	W.	61 10 38	2776	62 45 37	2786	64 20 23	2795	65 54 57	2806
	Spica	E.	30 10 49	2662	28 33 19	2675	26 56 06	2689	25 19 11	2702
	Antares	E.	75 52 53	2698	74 16 11	2711	72 39 46	2725	71 03 39	2739
	SATURN	E.	121 26 26	2715	119 50 06	2727	118 14 03	2739	116 38 15	2752
	α Aquilæ	E.	124 32 25	3271	123 07 40	3260	121 42 42	3252	120 17 34	3247
24	Aldebaran	W.	116 17 44	2770	117 52 51	2783	119 27 40	2796	121 02 13	2808
	Pollux	W.	73 44 20	2861	75 17 29	2872	76 50 23	2883	78 23 03	2895
	Regulus	W.	36 48 00	2812	38 22 12	2821	39 56 12	2831	41 30 00	2842
	Spica	E.	17 19 04	2770	15 43 57	2784	14 09 09	2798	12 34 39	2813
	Antares	E.	63 07 40	2809	61 33 24	2823	59 59 26	2837	58 25 46	2852
	SATURN	E.	108 43 25	2815	107 9 17	2828	105 35 25	2840	104 01 49	2852
	α Aquilæ	E.	113 11 00	3242	111 45 41	3244	110 20 24	3247	108 55 10	3251
	JUPITER	E.	118 52 32	2865	117 19 28	2877	115 46 40	2890	114 14 08	2902
25	Pollux	W.	86 02 39	2954	87 33 50	2965	89 04 46	2977	90 35 28	2988
	Regulus	W.	49 15 36	2894	50 48 03	2905	52 20 16	2914	53 52 17	2924
	Antares	E.	50 42 05	2924	49 10 16	2939	47 38 46	2954	46 07 35	2968
	SATURN	E.	96 17 50	2913	94 45 49	2925	93 14 02	2937	91 42 30	2948
	α Aquilæ	E.	101 50 30	3282	100 25 57	3288	99 01 32	3296	97 37 16	3305
	JUPITER	E.	106 35 17	2962	105 04 17	2973	103 33 31	2985	102 02 59	2996
26	Pollux	W.	98 05 29	3043	99 34 49	3053	101 03 56	3063	102 32 50	3073
	Regulus	W.	61 29 10	2973	62 59 56	2982	64 30 31	2991	66 00 55	2999
	Antares	E.	38 36 20	3045	37 07 03	3062	35 38 08	3079	34 09 33	3096
	SATURN	E.	84 08 17	3001	82 38 06	3011	81 08 07	3021	79 38 20	3030
	α Aquilæ	E.	90 38 29	3351	89 15 16	3361	87 52 15	3371	86 29 25	3380
	JUPITER	E.	94 33 43	3048	93 04 30	3058	91 35 30	3068	90 06 41	3077
	SUN	E.	127 30 55	3346	126 07 37	3356	124 44 31	3365	123 21 35	3374
27	Pollux	W.	109 54 20	3121	111 22 04	3129	112 49 38	3138	114 17 01	3147
	Regulus	W.	73 30 26	3037	74 59 53	3043	76 29 12	3049	77 58 23	3055
	Spica	W.	19 40 22	3021	21 10 08	3028	22 39 46	3034	24 09 17	3039
	Antares	E.	26 52 26	3206	25 26 24	3236	24 00 58	3267	22 36 09	3300
	SATURN	E.	72 12 04	3070	70 43 18	3078	69 14 41	3084	67 46 12	3090
	α Aquilæ	E.	79 38 11	3434	78 16 33	3446	76 55 08	3457	75 33 55	3469
	JUPITER	E.	82 45 14	3117	81 17 25	3124	79 49 45	3130	78 22 12	3137
	SUN	E.	116 29 21	3414	115 07 21	3421	113 45 28	3427	112 23 43	3433
28	Pollux	W.	121 31 28	3187	122 57 53	3194	124 24 10	3201	125 50 18	3209
	Regulus	W.	85 22 48	.3077	86 51 26	3080	88 19 59	3082	89 48 30	3084
	Spica	W.	31 35 20	3060	33 04 18	3063	34 33 12	3066	36 02 03	3068
	SATURN	E.	60 25 31	3115	58 57 40	3119	57 29 54	3122	56 02 12	3125
	α Aquilæ	E.	68 51 12	3530	67 31 21	3543	66 11 44	3557	64 52 23	3572
	JUPITER	E.	71 06 11	3161	69 39 16	3165	68 12 25	3168	66 45 37	3170
	SUN	E.	105 36 27	3457	104 15 15	3460	102 54 06	3462	101 33 00	3464

AT GREENWICH APPARENT NOON.

THE SUN'S

Day of the Week.	Day of the Month.	Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ' "	"	' "	s	m s	s
Sat.	1	22 46 06.92	+ 9.376	S. 7 49 30.9	+ 56.79	16 09.39	65.40	12 39.56	0.478
SUN.	2	22 49 51.69	9.356	7 26 44.4	57.07	16 09.15	65.32	12 27.82	0.499
Mon.	3	22 53 35.97	9.336	7 03 51.6	57.33	16 08.91	65.25	12 15.58	0.519
Tues.	4	22 57 19.80	+ 9.317	6 40 52.5	+ 57.57	16 08.66	65.18	12 02.88	0.538
Wed.	5	23 01 03.16	9.298	6 17 47.9	57.80	16 08.41	65.12	11 49.73	0.557
Thur.	6	23 04 46.10	9.280	5 54 38.1	58.01	16 08.16	65.05	11 36.16	0.574
Frid.	7	23 08 28.62	+ 9.263	5 31 23.3	+ 58.20	16 07.90	64.99	11 22.16	0.591
Sat.	8	23 12 10.74	9.247	5 08 04.1	58.38	16 07.65	64.93	11 07.77	0.607
SUN.	9	23 15 52.48	9.232	4 44 40.8	58.54	16 07.39	64.88	10 53.00	0.623
Mon.	10	23 19 33.86	+ 9.217	4 21 13.8	+ 58.69	16 07.13	64.83	10 37.87	0.638
Tues.	11	23 23 14.88	9.202	3 57 43.6	58.82	16 06.87	64.78	10 22.38	0.652
Wed.	12	23 26 55.57	9.189	3 34 10.6	58.93	16 06.61	64.73	10 06.55	0.666
Thur.	13	23 30 35.94	+ 9.176	3 10 35.1	+ 59.02	16 06.35	64.68	9 50.41	0.679
Frid.	14	23 34 16.01	9.164	2 46 57.6	59.10	16 06.09	64.64	9 33.97	0.691
Sat.	15	23 37 55.78	9.152	2 23 18.4	59.16	16 05.82	64.60	9 17.24	0.702
SUN.	16	23 41 35.29	+ 9.141	1 59 37.9	+ 59.21	16 05.56	64.57	9 00.25	0.713
Mon.	17	23 45 14.54	9.131	1 35 56.5	59.24	16 05.29	64.54	8 43.00	0.723
Tues.	18	23 48 53.59	9.122	1 12 14.5	59.26	16 05.02	64.51	8 25.54	0.732
Wed.	19	23 52 32.42	+ 9.114	0 48 32.2	+ 59.26	16 04.75	64.48	8 07.86	0.740
Thur.	20	23 56 11.07	9.107	0 24 50.2	59.24	16 04.48	64.46	7 50.01	0.747
Frid.	21	23 59 49.56	9.101	S. 0 01 8.6	59.22	16 04.20	64.44	7 31.99	0.754
Sat.	22	0 03 27.91	+ 9.096	N. 0 22 32.2	+ 59.18	16 03.93	64.42	7 13.84	0.759
SUN.	23	0 07 06.15	9.091	0 46 11.6	59.12	16 03.66	64.41	6 55.58	0.763
Mon.	24	0 10 44.30	9.088	1 09 49.7	59.05	16 03.39	64.40	6 37.24	0.766
Tues.	25	0 14 22.39	+ 9.086	1 33 26.0	+ 58.97	16 03.11	64.39	6 18.83	0.768
Wed.	26	0 18 00.44	9.085	1 57 00.0	58.87	16 02.84	64.38	6 00.38	0.769
Thur.	27	0 21 38.49	9.085	2 20 31.6	58.76	16 02.56	64.38	5 41.92	0.769
Frid.	28	0 25 16.53	+ 9.086	2 44 00.3	+ 58.63	16 02.28	64.38	5 23.46	0.768
Sat.	29	0 28 54.61	9.087	3 07 25.7	58.49	16 02.00	64.39	5 05.03	0.766
SUN.	30	0 32 32.72	9.090	3 30 47.6	58.33	16 01.73	64.39	4 46.65	0.764
Mon.	31	0 36 10.92	9.094	3 54 05.6	58.16	16 01.45	64.40	4 28.35	0.761
Tues.	32	0 39 49.21	+ 9.099	N. 4 17 19.3	+ 57.98	16 01.18	64.41	4 10.13	0.757

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting 0.18ˢ from the sidereal time. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week	Day of the Month	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	22 46 04.94	+ 9.378	S. 7 49 42.9	+ 56.80	12 39.66	+ 0.479	22 33 25.28
SUN.	2	22 49 49.75	9.357	7 26 56.3	57.08	12 27.92	0.499	22 37 21.83
Mon.	3	22 53 34.07	9.337	7 04 03.3	57.34	12 15.69	0.519	22 41 18.38
Tues.	4	22 57 17.93	+ 9.318	6 41 04.1	+ 57.58	12 02.99	+ 0.538	22 45 14.94
Wed.	5	23 01 01.33	9.300	6 17 59.3	57.81	11 49.84	0.557	22 49 11.49
Thur.	6	23 04 44.31	9.282	5 54 49.3	58.02	11 36.27	0.574	22 53 08.04
Frid.	7	23 08 26.87	+ 9.265	5 31 34.3	+ 58.21	11 22.27	+ 0.591	22 57 04.60
Sat.	8	23 12 09.03	9.249	5 08 14.9	58.39	11 07.88	0.607	23 01 01.15
SUN.	9	23 15 50.81	9.233	4 44 51.4	58.55	10 53.11	0.623	23 04 57.70
Mon.	10	23 19 32.23	+ 9.218	4 21 24.2	+ 58.70	10 37.98	+ 0.638	23 08 54.25
Tues.	11	23 23 13.29	9.204	3 57 53.8	58.83	10 22.49	0.652	23 12 50.80
Wed.	12	23 26 54.02	9.190	3 34 20.6	58.94	10 06.66	0.666	23 16 47.36
Thur.	13	23 30 34.43	+ 9.177	3 10 44.8	+ 59.03	9 50.52	+ 0.679	23 20 43.91
Frid.	14	23 34 14.54	9.165	2 47 07.1	59.11	9 34.08	0.691	23 24 40.46
Sat.	15	23 37 54.36	9.154	2 23 27.6	59.17	9 17.35	0.702	23 28 37.01
SUN.	16	23 41 33.92	+ 9.143	1 59 46.8	+ 59.22	9 00.36	+ 0.713	23 32 33.56
Mon.	17	23 45 13.22	9.133	1 36 05.1	59.25	8 43.12	0.723	23 36 30.12
Tues.	18	23 48 52.31	9.124	1 12 22.8	59.27	8 25.64	0.732	23 40 26.67
Wed.	19	23 52 31.18	+ 9.116	0 48 40.3	+ 59.27	8 07.96	+ 0.740	23 44 23.22
Thur.	20	23 56 09.88	9.109	0 24 58.0	59.25	7 50.11	0.747	23 48 19.77
Frid.	21	23 59 48.41	9.103	S. 0 01 16.1	59.23	7 32.09	0.754	23 52 16.32
Sat.	22	0 03 26.81	+ 9.098	N. 0 22 25.0	+ 59.19	7 13.93	+ 0.759	23 56 12.88
SUN.	23	0 07 05.10	9.094	0 46 04.8	59.13	6 55.67	0.763	0 00 09.43
Mon.	24	0 10 43.30	9.090	1 09 43.2	59.06	6 37.32	0.766	0 04 05.98
Tues.	25	0 14 21.44	+ 9.088	1 33 19.8	+ 58.98	6 18.91	+ 0.768	0 08 02.53
Wed.	26	0 17 59.54	9.087	1 56 54.1	58.88	6 00.46	0.769	0 11 59.08
Thur.	27	0 21 37.63	9.087	2 20 26.0	58.77	5 41.99	0.769	0 15 55.64
Frid.	28	0 25 15.72	+ 9.088	2 43 55.0	+ 58.64	5 23.53	+ 0.768	0 19 52.19
Sat.	29	0 28 53.84	9.090	3 07 20.7	58.50	5 05.10	0.766	0 23 48.74
SUN.	30	0 32 32.00	9.092	3 30 42.9	58.34	4 46.71	0.764	0 27 45.29
Mon.	31	0 36 10.25	9.096	3 54 01.2	58.17	4 28.41	0.761	0 31 41.84
Tues.	32	0 39 48.58	+ 9.100	N. 4 17 15.2	+ 57.99	4 10.18	+ 0.757	0 35 38.40

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
    The sign + prefixed to the hourly change of declination indicates that south declinations
    are decreasing; north declinations, increasing.

Diff. for 1 Hour,
+ 9.8565ˢ.
(Table III.)

		AT GREENWICH MEAN NOON.						
		THE SUN'S						
Day of the Month.	Day of the Year.	TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		λ	λ'					
		° ′ ″	′ ″	″	″			h m s
1	60	339 59 23.7	59 04.0	150.48	+ 0.05	9.996 1138	+ 46.1	1 26 20.54
2	61	340 59 34.5	59 14.6	150.42	0.17	9.996 2251	46.6	1 22 24.63
3	62	341 59 43.8	59 23.8	150.36	0.27	9.996 3375	47.0	1 18 28.72
4	63	342 59 51.4	59 31.4	150.29	+ 0.34	9.996 4508	+ 47.4	1 14 32.82
5	64	343 59 57.5	59 37.4	150.22	0.38	9.996 5649	47.7	1 10 36.91
6	65	344 60 02.0	59 41.8	150.15	0.40	9.996 6798	48.0	1 06 41.00
7	66	345 60 04.8	59 44.4	150.08	+ 0.40	9.996 7951	+ 48.2	1 02 45.10
8	67	346 60 05.8	59 45.4	150.01	0.37	9.996 9108	48.3	0 58 49.19
9	68	347 60 05.0	59 44.6	149.93	0.30	9.997 0268	48.4	0 54 53.29
10	69	348 60 02.4	59 41.9	149.85	+ 0.21	9.997 1430	+ 48.4	0 50 57.38
11	70	349 59 57.8	59 37.2	149.77	+ 0.10	9.997 2594	48.5	0 47 01.47
12	71	350 59 51.2	59 30.4	149.68	− 0.02	9.997 3759	48.6	0 43 05.56
13	72	351 59 42.4	59 21.6	149.59	− 0.16	9.997 4926	+ 48.7	0 39 09.66
14	73	352 59 31.4	59 10.5	149.50	0.29	9.997 6094	48.8	0 35 13.75
15	74	353 59 18.2	58 57.3	149.41	0.41	9.997 7267	48.9	0 31 17.85
16	75	354 59 02.7	58 41.7	149.31	− 0.53	9.997 8442	+ 49.1	0 27 21.94
17	76	355 58 44.9	58 23.8	149.21	0.61	9.997 9624	49.3	0 23 26.04
18	77	356 58 24.8	58 03.6	149.11	0.66	9.998 0811	49.6	0 19 30.13
19	78	357 58 02.4	57 41.1	149.02	− 0.69	9.998 2006	+ 49.9	0 15 34.22
20	79	358 57 37.7	57 16.4	148.93	0.69	9.998 3209	50.3	0 11 38.32
21	80	359 57 10.8	56 49.4	148.83	0.66	9.998 4420	50.6	0 07 42.41
22	81	0 56 41.7	56 20.2	148.74	− 0.58	9.998 5641	+ 51.0	{ 0 03 46.51 } { 23 59 50.60 }
23	82	1 56 10.5	55 48.9	148.65	0.50	9.998 6871	51.4	23 55 54.69
24	83	2 55 37.2	55 15.5	148.57	0.40	9.998 8110	51.8	23 51 58.78
25	84	3 55 01.9	54 40.2	148.49	− 0.26	9.998 9357	+ 52.1	23 48 02.88
26	85	4 54 24.6	54 02.8	148.41	0.14	9.999 0612	52.4	23 44 06.97
27	86	5 53 45.4	53 23.5	148.33	− 0.01	9.999 1874	52.7	23 40 11.06
28	87	6 53 04.3	52 42.3	148.25	+ 0.12	9.999 3142	+ 52.9	23 36 15.16
29	88	7 52 21.4	51 59.3	148.17	0.24	9.999 4412	53.1	23 32 19.25
30	89	8 51 36.7	51 14.5	148.10	0.34	9.999 5690	53.2	23 28 23.35
31	90	9 50 50.1	50 27.8	148.02	0.43	9.999 6969	53.3	23 24 27.44
32	91	10 50 01.7	49 39.4	147.94	+ 0.48	9.999 8248	+ 53.3	23 20 31.53

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' to the mean equinox of January 0,0ᵈ of the Besselian fictitious year.

Diff. for 1 Hour,
− 9.8296ˢ.
(Table II.)

MARCH, 1902.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 48.5	14 48.3	54 15.0	− 0.16	54 14.4	+ 0.06	17 52.9	+ 1.99	20.9
2	14 48.9	14 50.2	54 16.4	+ 0.27	54 21.1	0.49	18 40 7	2.01	21.9
3	14 52.2	14 54.8	54 28.4	0.71	54 38.1	0.91	19 29.1	2.02	22.9
4	14 58.1	15 02.1	54 50.3	+ 1.11	55 04.8	+ 1.28	20 17.9	+ 2.03	23 9
5	15 06.5	15 11.5	55 21.2	1.44	55 39.4	1.58	21 06.8	2.04	24.9
6	15 16.9	15 22.6	55 59.1	59	56 19.9	1.76	21 55.7	2.04	25.9
7	15 28.4	15 34.4	56 41.5	+ 1.81	57 03.4	+ 1.82	22 44.8	+ 2.05	26.9
8	15 40.3	15 46.2	57 25.2	1.80	57 46.6	1.73	23 34.2	2.07	27.9
9	15 51.7	15 56.9	58 06.9	1.64	58 25.9	1.51	6		28.9
10	16 01.6	16 05.7	58 43.2	+ 1.35	58 58.4	+ 1.18	0 24.3	+ 2.11	0.4
11	16 09.3	16 12.1	59 11.3	0.98	59 21.8	0.76	1 15.6	2.17	1.4
12	16 14.3	16 15.7	59 29.7	0.55	59 35.0	+ 0.34	2 08.6	2.25	2.4
13	16 16.5	16 16.6	59 37.9	+ 0.14	59 38.4	− 0.05	3 03.4	+ 2.32	3.4
14	16 16.2	16 15.2	59 36.7	− 0.22	59 33.0	0.38	4 00.1	2.39	4.4
15	16 13.7	16 11.8	59 27.7	0.51	59 20.8	0.63	4 58.1	2.43	5.4
16	16 09.6	16 07.1	59 12.7	− 0.72	59 03.5	− 0.80	5 56.4	+ 2.42	6.4
17	16 04.4	16 01.4	58 53.4	0.87	58 42.6	0.93	6 53.9	2.36	7.4
18	15 58.3	15 55.0	58 31 2	0.98	58 19.2	1.02	7 49.7	2.27	8.4
19	15 51.6	15 48.1	58 06.7	− 1.06	57 53.8	− 1.09	8 43.1	+ 2.17	9.4
20	15 44.5	15 40.7	57 40.4	1.13	57 26.7	1.16	9 34.0	2.08	10.4
21	15 36.9	15 33.0	57 12.6	1.19	56 58.2	1.21	10 22.8	2.00	11.4
22	15 29.0	15 24.9	56 43.5	− 1.23	56 28.6	− 1.24	11 10.0	+ 1.94	12.4
23	15 20.8	15 16.8	56 13.6	1.25	55 58.7	1.23	11 56.0	1.90	13.4
24	15 12.7	15 08.8	55 43.9	1.21	55 29.5	1.17	12 41.5	1.89	14.4
25	15 05.1	15 01.5	55 15.8	− 1.12	55 02.7	− 1.05	13 26.9	+ 1.90	15.4
26	14 58.2	14 55.2	54 50.6	0.95	54 39.7	0.85	14 12.8	1.92	16.4
27	14 52.7	14 50.5	54 30.2	0.72	54 22.3	0.58	14 59.1	1 94	17.4
28	14 48.9	14 47.7	54 16.3	− 0.42	54 12.2	− 0.25	15 46.0	+ 1.97	18.4
29	14 47.2	14 47.3	54 10.2	− 0.06	54 10.6	+ 0.13	16 33.5	1.99	19.4
30	14 48.0	14 49.5	54 13.3	+ 0.33	54 18.6	0.54	17 21.3	2.00	20.4
31	14 51.6	14 54.4	54 26.4	0.75	54 36.7	0.97	18 09.3	2.00	21.4
32	14 57.9	15 02.1	54 49.6	+ 1.18	55 05.0	+ 1.38	18 57.3	+ 2.00	22.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 1.					**MONDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	′
0	15 52 12.51	+ 2.0585	S.18 04 59.3	− 3.851	0	17 32 21.57	+ 2.1111	S.19 30 22.5	+ 0.369
1	15 54 16.06	2.0598	18 08 47.9	3.768	1	17 34 28.26	2.1119	19 29 57.6	0.462
2	15 56 19.69	2.0611	18 12 31.5	3.686	2	17 36 35.00	2.1127	19 29 27.1	0.554
3	15 58 23.39	2.0622	18 16 10.2	3.603	3	17 38 41.78	2.1134	19 28 51.1	0.646
4	16 00 27.16	2.0635	18 19 43.9	3.519	4	17 40 48.61	2.1142	19 28 09.6	0.737
5	16 02 31.01	2.0647	18 23 12.5	3.435	5	17 42 55.49	2.1150	19 27 22.6	0.830
6	16 04 34.93	2.0659	18 26 36.1	3.352	6	17 45 02.41	2.1157	19 26 30.0	0.922
7	16 06 38.92	2.0672	18 29 54.7	3.267	7	17 47 09.38	2.1165	19 25 31.9	1.014
8	16 08 42.99	2.0684	18 33 08.2	3.182	8	17 49 16.39	2.1172	19 24 28.3	1.107
9	16 10 47.13	2.0697	18 36 16.6	3.097	9	17 51 23.45	2.1180	19 23 19.1	1.200
10	16 12 51.35	2.0709	18 39 19.9	3.012	10	17 53 30.55	2.1187	19 22 04.3	1.292
11	16 14 55.64	2.0721	18 42 18.1	2.927	11	17 55 37.69	2.1193	19 20 44.0	1.385
12	16 17 00.00	2.0733	18 45 11.2	2.842	12	17 57 44.87	2.1200	19 19 18.1	1.477
13	16 19 04.44	2.0746	18 47 59.2	2.757	13	17 59 52.09	2.1207	19 17 46.7	1.570
14	16 21 08.95	2.0757	18 50 42.0	2.670	14	18 01 59.35	2.1212	19 16 09.7	1.663
15	16 23 13.53	2.0769	18 53 19.6	2.584	15	18 04 06.64	2.1218	19 14 27.1	1.756
16	16 25 18.18	2.0781	18 55 52.1	2.498	16	18 06 13.97	2.1225	19 12 39.0	1.848
17	16 27 22.90	2.0792	18 58 19.4	2.411	17	18 08 21.34	2.1231	19 10 45.3	1.942
18	16 29 27.69	2.0805	19 00 41.4	2.323	18	18 10 28.74	2.1237	19 08 46.0	2.034
19	16 31 32.56	2.0817	19 02 58.2	2.237	19	18 12 36.18	2.1242	19 06 41.2	2.127
20	16 33 37.49	2.0827	19 05 09.8	2.150	20	18 14 43.65	2.1247	19 04 30.8	2.219
21	16 35 42.49	2.0839	19 07 16.2	2.062	21	18 16 51.15	2.1252	19 02 14.9	2.312
22	16 37 47.56	2.0851	19 09 17.3	1.974	22	18 18 58.68	2.1257	18 59 53.4	2.404
23	16 39 52.70	+ 2.0862	S.19 11 13.1	− 1.886	23	18 21 06.24	+ 2.1262	S.18 57 26.4	+ 2.497
	SUNDAY 2.					**TUESDAY 4.**			
0	16 41 57.90	+ 2.0872	S.19 13 03.6	− 1.797	0	18 23 13.82	+ 2.1267	S.18 54 53.8	+ 2.589
1	16 44 03.17	2.0884	19 14 48.8	1.709	1	18 25 21.44	2.1272	18 52 15.7	2.682
2	16 46 08.51	2.0896	19 16 28.7	1.621	2	18 27 29.08	2.1276	18 49 32.0	2.774
3	16 48 13.92	2.0907	19 18 03.3	1.532	3	18 29 36.75	2.1281	18 46 42.8	2.867
4	16 50 19.39	2.0917	19 19 32.6	1.443	4	18 31 44.45	2.1285	18 43 48.0	2.959
5	16 52 24.93	2.0928	19 20 56.5	1.354	5	18 33 52.17	2.1289	18 40 47.7	3.052
6	16 54 30.53	2.0938	19 22 15.1	1.265	6	18 35 59.92	2.1293	18 37 41.8	3.144
7	16 56 36.19	2.0949	19 23 28.3	1.175	7	18 38 07.69	2.1297	18 34 30.4	3.236
8	16 58 41.92	2.0960	19 24 36.1	1.086	8	18 40 15.48	2.1301	18 31 13.5	3.327
9	17 00 47.71	2.0970	19 25 38.6	0.997	9	18 42 23.30	2.1304	18 27 51.1	3.419
10	17 02 53.56	2.0981	19 26 35.7	0.906	10	18 44 31.13	2.1307	18 24 23.2	3.512
11	17 04 59.48	2.0991	19 27 27.3	0.815	11	18 46 38.99	2.1311	18 20 49.7	3.603
12	17 07 05.45	2.1000	19 28 13.5	0.725	12	18 48 46.86	2.1313	18 17 10.8	3.695
13	17 09 11.48	2.1011	19 28 54.3	0.635	13	18 50 54.75	2.1317	18 13 26.3	3.787
14	17 11 17.58	2.1021	19 29 29.7	0.544	14	18 53 02.66	2.1320	18 09 36.4	3.877
15	17 13 23.73	2.1029	19 29 59.6	0.452	15	18 55 10.59	2.1322	18 05 41.0	3.969
16	17 15 29.93	2.1039	19 30 24.0	0.362	16	18 57 18.53	2.1325	18 01 40.1	4.060
17	17 17 36.20	2.1049	19 30 43.0	0.271	17	18 59 26.49	2.1327	17 57 33.8	4.151
18	17 19 42.52	2.1057	19 30 56.5	0.180	18	19 01 34.46	2.1330	17 53 22.0	4.242
19	17 21 48.89	2.1067	19 31 04.6	− 0.089	19	19 03 42.45	2.1332	17 49 04.8	4.332
20	17 23 55.32	2.1076	19 31 07.2	+ 0.002	20	19 05 50.45	2.1334	17 44 42.1	4.423
21	17 26 01.80	2.1085	19 31 04.3	0.095	21	19 07 58.46	2.1337	17 40 14.0	4.513
22	17 28 08.34	2.1094	19 30 55.8	0.187	22	19 10 06.49	2.1338	17 35 40.5	4.603
23	17 30 14.93	2.1102	19 30 41.9	0.277	23	19 12 14.52	2.1340	17 31 01.6	4.693
24	17 32 21.57	+ 2.1111	S.19 30 22.5	+ 0.369	24	19 14 22.57	+ 2.1342	S.17 26 17.3	+ 4.783

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
			WEDNESDAY 5.					**FRIDAY 7.**	
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 14 22.57	+ 2.1342	S.17 26 17.3	+ 4.783	0	20 56 54.97	+ 2.1381	S.11 59 03.6	+ 8.698
1	19 16 30.63	2.1344	17 21 27.6	4.872	1	20 59 03.26	2.1382	11 50 19.6	8.769
2	19 18 38.70	2.1345	17 16 32.6	4.962	2	21 01 11.56	2.1384	11 41 31.3	8.839
3	19 20 46.77	2.1347	17 11 32.2	5.051	3	21 03 19.87	2.1387	11 32 38.9	8.907
4	19 22 54.86	2.1348	17 06 26.5	5.139	4	21 05 28.20	2.1388	11 23 42.4	8.976
5	19 25 02.95	2.1349	17 01 15.5	5.227	5	21 07 36.53	2.1390	11 14 41.8	9.043
6	19 27 11.05	2.1351	16 55 59.2	5.316	6	21 09 44.88	2.1392	11 05 37.2	9.110
7	19 29 19.16	2.1352	16 50 37.6	5.404	7	21 11 53.24	2.1395	10 56 28.6	9.177
8	19 31 27.28	2.1353	16 45 10.7	5.492	8	21 14 01.62	2.1397	10 47 16.0	9.242
9	19 33 35.40	2.1353	16 39 38.5	5.580	9	21 16 10.01	2.1399	10 37 59.5	9.307
10	19 35 43.52	2.1354	16 34 01.1	5.667	10	21 18 18.41	2.1402	10 28 39.1	9.372
11	19 37 51.65	2.1356	16 28 18.5	5.754	11	21 20 26 84	2.1406	10 19 14.8	9.436
12	19 39 59.79	2.1357	16 22 30.6	5.841	12	21 22 35.28	2.1408	10 09 46.8	9.498
13	19 42 07.93	2.1357	16 16 37.6	5.927	13	21 24 43.74	2.1412	10 00 15.0	9.560
14	19 44 16.08	2.1358	16 10 39.4	6.013	14	21 26 52.22	2.1415	9 50 39.6	9.621
15	19 46 24.23	2.1358	16 04 36.0	6.099	15	21 29 00.72	2.1419	9 41 00.5	9.682
16	19 48 32.38	2.1359	15 58 27.5	6.184	16	21 31 09.25	2.1423	9 31 17.7	9.742
17	19 50 40.54	2.1360	15 52 13.9	6.269	17	21 33 17.80	2.1427	9 21 31.4	9.802
18	19 52 48.70	2.1360	15 45 55.2	6.354	18	21 35 26.37	2.1430	9 11 41.5	9.861
19	19 54 56.86	2.1361	15 39 31.4	6.438	19	21 37 34.96	2.1434	9 01 48.1	9.918
20	19 57 05.03	2.1362	15 33 02.6	6.522	20	21 39 43.58	2.1439	8 51 51.3	9.975
21	19 59 13.20	2.1362	15 26 28.7	6.607	21	21 41 52.23	2 1444	8 41 51.1	10.031
22	20 01 21.38	2.1362	15 19 49.8	6.690	22	21 44 00.91	2.1449	8 31 47.6	10.087
23	20 03 29.55	+ 2.1362	S.15 13 05.9	+ 6.772	23	21 46 09.62	+ 2.1454	S. 8 21 40.7	+ 10.142
			THURSDAY 6.					**SATURDAY 8.**	
0	20 05 37.73	+ 2.1363	S.15 06 17.1	+ 6.855	0	21 48 18.36	+ 2.1459	S. 8 11 30.6	+ 10.195
1	20 07 45.91	2.1363	14 59 23.3	6.937	1	21 50 27.13	2.1464	8 01 17.3	10.248
2	20 09 54.09	2.1364	14 52 24.6	7.019	2	21 52 35.93	2.1470	7 51 00.8	10.301
3	20 12 02.28	2.1364	14 45 21.0	7.101	3	21 54 44.77	2.1477	7 40 41.2	10.352
4	20 14 10.46	2.1364	14 38 12.5	7.182	4	21 56 53.65	2.1482	7 30 18.6	10.402
5	20 16 18.65	2.1365	14 30 59.2	7.262	5	21 59 02.56	2.1488	7 19 53.0	10.452
6	20 18 26.84	2.1366	14 23 41.1	7.342	6	22 01 11.51	2.1495	7 09 24.4	10.501
7	20 20 35.04	2.1367	14 16 18.1	7.422	7	22 03 20.50	2.1502	6 58 52.9	10.548
8	20 22 43.24	2.1367	14 08 50.4	7.501	8	22 05 29.53	2.1509	6 48 18.6	10.595
9	20 24 51.44	2.1367	14 01 18.0	7.579	9	22 07 38.61	2.1517	6 37 41.5	10.642
10	20 26 59.64	2.1367	13 53 40.9	7.657	10	22 09 47.73	2.1524	6 27 01.6	10.687
11	20 29 07.85	2.1367	13 45 59.1	7.736	11	22 11 56.90	2.1532	6 16 19.1	10.731
12	20 31 16.05	2.1367	13 38 12.6	7.813	12	22 14 06.11	2.1539	6 05 33.9	10.775
13	20 33 24.26	2.1369	13 30 21.5	7.890	13	22 16 15.37	2.1547	5 54 46.1	10.817
14	20 35 32.48	2.1370	13 22 25.8	7.966	14	22 18 24.68	2.1556	5 43 55.8	10.858
15	20 37 40.70	2.1371	13 14 25.6	8.041	15	22 20 34.04	2.1565	5 33 03.1	10 899
16	20 39 48.93	2.1372	13 06 20.9	8.117	16	22 22 43.46	2.1575	5 22 07.9	10.939
17	20 41 57.16	2.1372	12 58 11.6	8.192	17	22 24 52.94	2.1584	5 11 10.4	10.977
18	20 44 05.40	2.1373	12 49 57.9	8.266	18	22 27 02.47	2.1593	5 00 10.6	11.015
19	20 46 13.64	2.1374	12 41 39.7	8.340	19	22 29 12.06	2.1602	4 49 08.6	11.052
20	20 48 21.89	2.1376	12 33 17.1	8.412	20	22 31 21.70	2.1612	4 38 04.4	11.088
21	20 50 30.15	2.1377	12 24 50.2	8.484	21	22 33 31.41	2.1624	4 26 58.0	11.123
22	20 52 38.41	2.1378	12 16 19.0	8.557	22	22 35 41.19	2.1635	4 15 49.6	11.157
23	20 54 46.69	2.1380	12 07 43.4	8.628	23	22 37 51.03	2.1645	4 04 39.2	11.189
24	20 56 54.97	+ 2.1381	S.11 59 03.6	+ 8.698	24	22 40 00.93	+ 2.1656	S. 3 53 26.9	+ 11.221

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 9.					**TUESDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 40 00.93	+ 2.1656	S. 3 53 26.9	+ 11.221	0	0 25 49.59	+ 2.2546	N. 5 20 45.5	+ 11.415
1	22 42 10.90	2.1667	3 42 12.7	11.252	1	0 28 04.94	2.2572	5 32 09.6	11.388
2	22 44 20.94	2.1680	3 30 56.7	11.282	2	0 30 20.45	2.2598	5 43 32.1	11.362
3	22 46 31.06	2.1692	3 19 38.9	11.311	3	0 32 36.12	2.2624	5 54 53.0	11.333
4	22 48 41.25	2.1704	3 08 19.4	11.338	4	0 34 51.94	2.2650	6 06 12.1	11.303
5	22 50 51.51	2.1717	2 56 58.3	11.364	5	0 37 07.92	2.2677	6 17 29.4	11.272
6	22 53 01.85	2.1730	2 45 35.7	11.390	6	0 39 24.07	2.2704	6 28 44.7	11.238
7	22 55 12.27	2.1743	2 34 11.5	11.415	7	0 41 40.37	2.2730	6 39 58.0	11.205
8	22 57 22.77	2.1757	2 22 45.9	11.438	8	0 43 56.83	2.2757	6 51 09.3	11.171
9	22 59 33.35	2.1770	2 11 18.9	11.460	9	0 46 13.46	2.2786	7 02 18.5	11.134
10	23 01 44.01	2.1784	1 59 50.7	11.481	10	0 48 30.26	2.2813	7 13 25.4	11.096
11	23 03 54.76	2.1799	1 48 21.2	11.502	11	0 50 47.22	2.2841	7 24 30.0	11.057
12	23 06 05.60	2.1814	1 36 50.5	11.521	12	0 53 04.35	2.2869	7 35 32.2	11.017
13	23 08 16.53	2.1829	1 25 18.7	11.538	13	0 55 21.65	2.2897	7 46 32.0	10.975
14	23 10 27.55	2.1844	1 13 45.9	11.555	14	0 57 39.12	2.2926	7 57 29.2	10.932
15	23 12 38.66	2.1860	1 02 12.1	11.571	15	0 59 56.76	2.2954	8 08 23.8	10.887
16	23 14 49.87	2.1876	0 50 37.4	11.586	16	1 02 14.57	2.2982	8 19 15.7	10.842
17	23 17 01.17	2.1892	0 39 01.8	11.599	17	1 04 32.55	2.3012	8 30 04.8	10.795
18	23 19 12.57	2.1908	0 27 25.5	11.611	18	1 06 50.71	2.3041	8 40 51.1	10.747
19	23 21 24.07	2.1926	0 15 48.5	11.622	19	1 09 09.04	2.3070	8 51 34.5	10.697
20	23 23 35.68	2.1943	S. 0 04 10.8	11.632	20	1 11 27.55	2.3100	9 02 14.8	10.647
21	23 25 47.39	2.1960	N. 0 07 27.4	11.641	21	1 13 46.24	2.3129	9 12 52.1	10.595
22	23 27 59.20	2.1978	0 19 06.1	11.648	22	1 16 05.10	2.3158	9 23 26.2	10.541
23	23 30 11.13	+ 2.1997	0 30 45.2	+ 11.654	23	1 18 24.14	+ 2.3188	N. 9 33 57.0	+ 10.487
	MONDAY 10.					**WEDNESDAY 12.**			
0	23 32 23.16	+ 2.2014	N. 0 42 24.6	+ 11.659	0	1 20 43.36	+ 2.3218	N. 9 44 24.6	+ 10.432
1	23 34 35.30	2.2033	0 54 04.3	11.664	1	1 23 02.76	2.3248	9 54 48.8	10.373
2	23 36 47.56	2.2053	1 05 44.3	11.667	2	1 25 22.34	2.3278	10 05 09.4	10.314
3	23 38 59.94	2.2072	1 17 24.4	11.668	3	1 27 42.10	2.3308	10 15 26.5	10.255
4	23 41 12.43	2.2092	1 29 04.5	11.668	4	1 30 02.04	2.3338	10 25 40.0	10.194
5	23 43 25.04	2.2112	1 40 44.6	11.667	5	1 32 22.16	2.3368	10 35 49.8	10.132
6	23 45 37.77	2.2132	1 52 24.6	11.666	6	1 34 42.46	2.3399	10 45 55.8	10.068
7	23 47 50.62	2.2152	2 04 04.5	11.663	7	1 37 02.95	2.3429	10 55 58.0	10.003
8	23 50 03.60	2.2173	2 15 44.2	11.658	8	1 39 23.61	2.3459	11 05 56.2	9.937
9	23 52 16.70	2.2194	2 27 23.5	11.652	9	1 41 44.46	2.3490	11 15 50.5	9.871
10	23 54 29.93	2.2216	2 39 02.4	11.645	10	1 44 05.49	2.3520	11 25 40.7	9.802
11	23 56 43.29	2.2238	2 50 40.9	11.637	11	1 46 26.70	2.3550	11 35 26.7	9.732
12	23 58 56.79	2.2261	3 02 18.9	11.628	12	1 48 48.09	2.3581	11 45 08.5	9.661
13	0 01 10.42	2.2282	3 13 56.3	11.617	13	1 51 09.67	2.3612	11 54 46.0	9.588
14	0 03 24.18	2.2305	3 25 32.9	11.604	14	1 53 31.43	2.3642	12 04 19.1	9.515
15	0 05 38.08	2.2328	3 37 08.8	11.592	15	1 55 53.37	2.3672	12 13 47.8	9.440
16	0 07 52.12	2.2351	3 48 43.9	11.577	16	1 58 15.49	2.3702	12 23 11.9	9.363
17	0 10 06.29	2.2374	4 00 18.1	11.562	17	2 00 37.79	2.3732	12 32 31.4	9.287
18	0 12 20.61	2.2398	4 11 51.3	11.544	18	2 03 00.28	2.3762	12 41 46.3	9.208
19	0 14 35.07	2.2422	4 23 23.4	11.526	19	2 05 22.94	2.3792	12 50 56.4	9.129
20	0 16 49.68	2.2447	4 34 54.4	11.507	20	2 07 45.79	2.3822	13 00 01.8	9.048
21	0 19 04.44	2.2472	4 46 24.2	11.486	21	2 10 08.82	2.3852	13 09 02.2	8.966
22	0 21 19.34	2.2496	4 57 52.7	11.463	22	2 12 32.02	2.3882	13 17 57.7	8.883
23	0 23 34.39	2.2521	5 09 19.8	11.440	23	2 14 55.41	2.3912	13 26 48.2	8.799
24	0 25 49.59	+ 2.2546	N. 5 20 45.5	+ 11.415	24	2 17 18.97	+ 2.3942	N.13 35 33 6	+ 8.713

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 13.					**SATURDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 17 18.97	+ 2.3942	N.13 35 33.6	+ 8.713	0	4 15 05.19	+ 2.4963	N.18 36 36.5	+ 3.517
1	2 19 42.71	2.3971	13 44 13.8	8.627	1	4 17 35.00	2.4972	18 40 03.8	3.392
2	2 22 06.62	2.4000	13 52 48.8	8.539	2	4 20 04.86	2.4980	18 43 23.6	3.267
3	2 24 30.71	2.4029	14 01 18.5	8.451	3	4 22 34.76	2.4987	18 46 35.8	3.141
4	2 26 54.97	2.4057	14 09 42.9	8.361	4	4 25 04.70	2.4993	18 49 40.5	3.015
5	2 29 19.40	2.4087	14 18 01.8	8.269	5	4 27 34.68	2.4999	18 52 37.6	2.889
6	2 31 44.01	2.4116	14 26 15.2	8.177	6	4 30 04.69	2.5004	18 55 27.2	2.762
7	2 34 08.79	2.4143	14 34 23.1	8.085	7	4 32 34.73	2.5c08	18 58 09.1	2.636
8	2 36 33.73	2.4171	14 42 25.4	7.991	8	4 35 04.79	2.5012	19 00 43.5	2.509
9	2 38 58.84	2.4198	14 50 22.0	7.896	9	4 37 34.88	2.5016	19 03 10.2	2.382
10	2 41 24.11	2.4226	14 58 12.9	7.800	10	4 40 04.98	2.5017	19 05 29.3	2.254
11	2 43 49.55	2.4254	15 05 58.0	7.702	11	4 42 35.09	2.5018	19 07 40.7	2.127
12	2 46 15.16	2.4282	15 13 37.2	7.604	12	4 45 05.20	2.5019	19 09 44.5	1.999
13	2 48 40.93	2.4308	15 21 10.5	7.505	13	4 47 35.32	2.5020	19 11 40.6	1.871
14	2 51 06.85	2.4333	15 28 37.8	7.404	14	4 50 05.44	2.5020	19 13 29.0	1.742
15	2 53 32.93	2.4360	15 35 59.0	7.302	15	4 52 35.56	2.5019	19 15 09.7	1.615
16	2 55 59.17	2.4385	15 43 14.1	7.201	16	4 55 05.67	2.5017	19 16 42.8	1.487
17	2 58 25.55	2.4410	15 50 23.1	7.098	17	4 57 35.76	2.5014	19 18 08.1	1.358
18	3 00 52.09	2.4436	15 57 25.9	6.994	18	5 00 05.84	2.5011	19 19 25.7	1.230
19	3 03 18.78	2.4461	16 04 22.4	6.889	19	5 02 35.89	2.5006	19 20 35.7	1.102
20	3 05 45.62	2.4485	16 11 12.6	6.783	20	5 05 05.91	2.5001	19 21 37.9	0.972
21	3 08 12.60	2.4508	16 17 56.4	6.676	21	5 07 35.90	2.4996	19 22 32.4	0.844
22	3 10 39.72	2.4532	16 24 33.7	6.568	22	5 10 05.86	2.4990	19 23 19.2	0.716
23	3 13 06.98	+ 2.4554	N.16 31 04.6	+ 6.460	23	5 12 35.78	+ 2.4982	N.19 23 58.3	+ 0.587
	FRIDAY 14.					**SUNDAY 16.**			
0	3 15 34.37	+ 2.4577	N.16 37 28.9	+ 6.351	0	5 15 05.65	+ 2.4975	N.19 24 29.7	+ 0.460
1	3 18 01.90	2.4599	16 43 46.7	6.241	1	5 17 35.48	2.4967	19 24 53.5	0.332
2	3 20 29.56	2.4621	16 49 57.8	6.129	2	5 20 05.25	2.4957	19 25 09.5	0.203
3	3 22 57.35	2.4642	16 56 02.2	6.017	3	5 22 34.96	2.4947	19 25 17.9	+ 0.076
4	3 25 25.27	2.4663	17 01 59.9	5.905	4	5 25 04.61	2.4936	19 25 18.6	− 0.052
5	3 27 53 31	2.4683	17 07 50.8	5.792	5	5 27 34.19	2.4925	19 25 11.6	0.180
6	3 30 21.47	2.4703	17 13 34.9	5.677	6	5 30 03.71	2.4913	19 24 57.0	0.307
7	3 32 49.75	2.4722	17 19 12.1	5.562	7	5 32 33.15	2.4900	19 24 34.8	0.434
8	3 35 18.14	2.4741	17 24 42.4	5.447	8	5 35 02.51	2.4886	19 24 04.9	0.562
9	3 37 46.64	2.4759	17 30 05.7	5.331	9	5 37 31.78	2.4872	19 23 27.4	0.688
10	3 40 15.25	2.4777	17 35 22.1	5.214	10	5 40 00.97	2.4857	19 22 42.4	0.813
11	3 42 43.97	2.4794	17 40 31.4	5.097	11	5 42 30.07	2.4842	19 21 49.8	0.940
12	3 45 12.78	2.4810	17 45 33.7	4.979	12	5 44 59.07	2.4825	19 20 49.6	1.066
13	3 47 41.69	2.4827	17 50 28.9	4.860	13	5 47 27.97	2.4808	19 19 41.9	1.191
14	3 50 10.70	2 4842	17 55 16.9	4.740	14	5 49 56.77	2.4791	19 18 26.7	1.317
15	3 52 39.80	2.4857	17 59 57.7	4.620	15	5 52 25.46	2.4772	19 17 03.9	1.442
16	3 55 08.99	2.4872	18 04 31.3	4.499	16	5 54 54.04	2.4753	19 15 33.7	1.565
17	3 57 38.26	2.4885	18 08 57.6	4.378	17	5 57 22.50	2.4734	19 13 56.1	1.689
18	4 00 07.61	2.4898	18 13 16.7	4.257	18	5 59 50.85	2.4714	19 12 11.0	1.813
19	4 02 37.04	2.4911	18 17 28.5	4.135	19	6 02 19.07	2.4692	19 10 18.5	1.936
20	4 05 06.54	2.4922	18 21 32.9	4.012	20	6 04 47.16	2.4672	19 08 18.7	2.058
21	4 07 36.11	2.4933	18 25 29.9	3.888	21	6 07 15.13	2.4650	19 06 11.5	2.181
22	4 10 05.74	2.4944	18 29 19.5	3.765	22	6 09 42.96	2.4627	19 03 57.0	2.302
23	4 12 35.44	2.4954	18 33 01.7	3.642	23	6 12 10.65	2.4602	19 01 35.2	2.423
24	4 15 05.19	+ 2.4963	N.18 36 36.5	+ 3.517	24	6 14 38.19	+ 2.4579	N.18 59 06.2	− 2.544

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 17.					**WEDNESDAY 19.**				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 14 38.19	+ 2.4579	N.18 59 06.2	− 2.544	0	8 09 00.87	+ 2.2961	N.14 51 04.0	− 7.474
1	6 17 05.60	2.4556	18 56 29.9	2.664	1	8 11 18.52	2.2922	14 43 33.1	7.555
2	6 19 32.86	2.4530	18 53 46.5	2.783	2	8 13 35.93	2.2882	14 35 57.4	7.634
3	6 21 59.96	2.4504	18 50 55.9	2.902	3	8 15 53.11	2.2844	14 28 17.0	7.712
4	6 24 26.91	2.4478	18 47 58.2	3.021	4	8 18 10.06	2.2806	14 20 31.9	7.791
5	6 26 53.70	2.4452	18 44 53.4	3.139	5	8 20 26.78	2.2767	14 12 42.1	7.868
6	6 29 20.33	2.4425	18 41 41.5	3.257	6	8 22 43.27	2.2728	14 04 47.7	7.944
7	6 31 46.80	2.4397	18 38 22.6	3.373	7	8 24 59.52	2.2689	13 56 48.8	8.018
8	6 34 13.10	2.4369	18 34 56.7	3.489	8	8 27 15.54	2.2651	13 48 45.5	8.092
9	6 36 39.23	2.4340	18 31 23.9	3.604	9	8 29 31.33	2.2612	13 40 37.8	8.165
10	6 39 05.18	2.4310	18 27 44.2	3.719	10	8 31 46.89	2.2574	13 32 25.7	8.237
11	6 41 30.95	2.4281	18 23 57.6	3.833	11	8 34 02.22	2.2535	13 24 09.3	8.308
12	6 43 56.55	2.4252	18 20 04.2	3.946	12	8 36 17.31	2.2497	13 15 48.7	8.377
13	6 46 21.97	2.4221	18 16 04.1	4.058	13	8 38 32.18	2.2459	13 07 24.0	8.446
14	6 48 47.20	2.4189	18 11 57.2	4.171	14	8 40 46.82	2.2421	12 58 55.2	8.513
15	6 51 12.24	2.4157	18 07 43.6	4.282	15	8 43 01.23	2.2383	12 50 22.4	8.580
16	6 53 37.09	2.4126	18 03 23.4	4.392	16	8 45 15.42	2.2346	12 41 45.6	8.646
17	6 56 01.75	2.4094	17 58 56.6	4.502	17	8 47 29.38	2.2307	12 33 04.9	8.711
18	6 58 26.22	2.4062	17 54 23.2	4.611	18	8 49 43.11	2.2270	12 24 20.3	8.774
19	7 00 50.49	2.4028	17 49 43.3	4.718	19	8 51 56.62	2.2232	12 15 32.0	8.836
20	7 03 14.55	2.3994	17 44 57.0	4.826	20	8 54 09.90	2.2195	12 06 40.0	8.897
21	7 05 38.42	2.3962	17 40 04.2	4.932	21	8 56 22.96	2.2158	11 57 44.3	8.958
22	7 08 02.09	2.3928	17 35 05.1	5.038	22	8 58 35.80	2.2121	11 48 45.0	9.017
23	7 10 25.55	+ 2.3892	N.17 29 59.6	− 5.143	23	9 00 48.41	+ 2.2084	N.11 39 42.2	− 9.076
TUESDAY 18.					**THURSDAY 20.**				
0	7 12 48.80	+ 2.3858	N.17 24 47.9	− 5.247	0	9 03 00.81	+ 2.2048	N.11 30 35.9	− 9.133
1	7 15 11.85	2.3823	17 19 29.9	5.351	1	9 05 12.99	2.2012	11 21 26.2	9.190
2	7 17 34.68	2.3787	17 14 05.8	5.452	2	9 07 24.95	2.1975	11 12 13.1	9.245
3	7 19 57.30	2.3752	17 08 35.6	5.554	3	9 09 36.69	2.1939	11 02 56.8	9.298
4	7 22 19.71	2.3717	17 02 59.3	5.655	4	9 11 48.22	2.1904	10 53 37.3	9.352
5	7 24 41.90	2.3680	16 57 17.0	5.755	5	9 13 59.54	2.1868	10 44 14.6	9.404
6	7 27 03.87	2.3643	16 51 28.7	5.854	6	9 16 10.64	2.1833	10 34 48.8	9.456
7	7 29 25.62	2.3607	16 45 34.5	5.952	7	9 18 21.54	2.1798	10 25 19.9	9.506
8	7 31 47.16	2.3571	16 39 34.5	6.048	8	9 20 32.22	2.1762	10 15 48.1	9.554
9	7 34 08.47	2.3533	16 33 28.7	6.145	9	9 22 42.69	2.1728	10 06 13.4	9.602
10	7 36 29.56	2.3496	16 27 17.1	6.240	10	9 24 52.96	2.1694	9 56 35.8	9.650
11	7 38 50.42	2.3458	16 20 59.9	6.334	11	9 27 03.02	2.1660	9 46 55.4	9.696
12	7 41 11.06	2.3421	16 14 37.0	6.427	12	9 29 12.88	2.1627	9 37 12.3	9.740
13	7 43 31.47	2.3383	16 08 08.6	6.520	13	9 31 22.54	2.1593	9 27 26.6	9.784
14	7 45 51.66	2.3346	16 01 34.6	6.612	14	9 33 32.00	2.1560	9 17 38.2	9.827
15	7 48 11.62	2.3307	15 54 55.2	6.702	15	9 35 41.26	2.1527	9 07 47.3	9.869
16	7 50 31.35	2.3268	15 48 10.4	6.792	16	9 37 50.32	2.1494	8 57 53.9	9.910
17	7 52 50.84	2.3230	15 41 20.2	6.881	17	9 39 59.19	2.1462	8 47 58.1	9.949
18	7 55 10.11	2.3192	15 34 24.7	6.968	18	9 42 07.86	2.1430	8 38 00.0	9.988
19	7 57 29.15	2.3154	15 27 24.0	7.055	19	9 44 16.35	2.1398	8 27 59.5	10.027
20	7 59 47.96	2.3116	15 20 18.1	7.141	20	9 46 24.64	2.1367	8 17 56.8	10.063
21	8 02 06.54	2.3077	15 13 07.1	7.226	21	9 48 32.75	2.1336	8 07 52.0	10.098
22	8 04 24.88	2.3037	15 05 51.0	7.309	22	9 50 40.67	2.1305	7 57 45.0	10.134
23	8 06 42.99	2.2999	14 58 30.0	7.392	23	9 52 48.41	2.1274	7 47 35.9	10.167
24	8 09 00.87	+ 2.2961	N.14 51 04.0	− 7.474	24	9 54 55.96	+ 2.1243	N. 7 37 24.9	− 10.200

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 21. / SUNDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 54 55.96	+2.1243	N. 7 37 24.9	−10.200	0	11 34 05.64	+2.0214	S. 0 51 39.0	−10.657
1	9 57 03.33	2.1214	7 27 11.9	10.232	1	11 36 06.89	2.0202	1 02 18.0	10.644
2	9 59 10.53	2.1185	7 16 57.1	10.262	2	11 38 08.07	2.0190	1 12 56.3	10.632
3	10 01 17.55	2.1156	7 06 40.5	10.292	3	11 40 09.17	2.0178	1 23 33.8	10.617
4	10 03 24.40	2.1127	6 56 22.1	10.321	4	11 42 10.21	2.0167	1 34 10.4	10.602
5	10 05 31.07	2.1098	6 46 02.0	10.349	5	11 44 11.18	2.0156	1 44 46.1	10.587
6	10 07 37.57	2.1070	6 35 40.2	10.377	6	11 46 12.08	2.0145	1 55 20.8	10.570
7	10 09 43.91	2.1042	6 25 16.8	10.402	7	11 48 12.92	2.0135	2 05 54.5	10.553
8	10 11 50.08	2.1014	6 14 51.9	10.427	8	11 50 13.70	2.0126	2 16 27.2	10.535
9	10 13 56.08	2.0987	6 04 25.6	10.450	9	11 52 14.43	2.0117	2 26 58.7	10.516
10	10 16 01.92	2.0960	5 53 57.9	10.473	10	11 54 15.10	2.0107	2 37 29.1	10.497
11	10 18 07.60	2.0934	5 43 28.8	10.496	11	11 56 15.71	2.0097	2 47 58.3	10.476
12	10 20 13.13	2.0908	5 32 58.4	10.517	12	11 58 16.27	2.0089	2 58 26.2	10.454
13	10 22 18.50	2.0882	5 22 26.8	10.537	13	12 00 16.78	2.0081	3 08 52.8	10.432
14	10 24 23.72	2.0857	5 11 54.0	10.556	14	12 02 17.24	2.0073	3 19 18.1	10.410
15	10 26 28.78	2.0832	5 01 20.1	10.573	15	12 04 17.66	2.0066	3 29 42.0	10.387
16	10 28 33.70	2.0807	4 50 45.2	10.591	16	12 06 18.03	2.0058	3 40 04.5	10.362
17	10 30 38.47	2.0782	4 40 09.2	10.607	17	12 08 18.36	2.0052	3 50 25.5	10.337
18	10 32 43.09	2.0759	4 29 32.3	10.622	18	12 10 18.66	2.0046	4 00 45.0	10.312
19	10 34 47.58	2.0736	4 18 54.5	10.637	19	12 12 18.91	2.0039	4 11 03.0	10.286
20	10 36 51.92	2.0712	4 08 15.9	10.650	20	12 14 19.13	2.0034	4 21 19.3	10.257
21	10 38 56.12	2.0689	3 57 36.5	10.662	21	12 16 19.32	2.0028	4 31 33.9	10.229
22	10 41 00.19	2.0667	3 46 56.4	10.674	22	12 18 19.47	2.0022	4 41 46.8	10.201
23	10 43 04.13	+2.0645	N. 3 36 15.6	−10.685	23	12 20 19.59	+2.0018	S. 4 51 58.0	−10.172

SATURDAY 22. / MONDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 45 07.93	+2.0623	N. 3 25 34.2	−10.694	0	12 22 19.69	+2.0014	S. 5 02 07.4	−10.141
1	10 47 11.60	2.0602	3 14 52.3	10.702	1	12 24 19.76	2.0010	5 12 14.9	10.110
2	10 49 15.15	2.0581	3 04 09.9	10.711	2	12 26 19.81	2.0006	5 22 20.6	10.078
3	10 51 18.57	2.0560	2 53 27.0	10.717	3	12 28 19.83	2.0002	5 32 24.3	10.046
4	10 53 21.87	2.0540	2 42 43.8	10.722	4	12 30 19.83	1.9999	5 42 26.1	10.012
5	10 55 25.05	2.0520	2 32 00.3	10.727	5	12 32 19.82	1.9997	5 52 25.8	9.978
6	10 57 28.11	2.0501	2 21 16.5	10.732	6	12 34 19.79	1.9993	6 02 23.5	9.944
7	10 59 31.06	2.0482	2 10 32.4	10.736	7	12 36 19.74	1.9991	6 12 19.1	9.909
8	11 01 33.90	2.0463	1 59 48.2	10.737	8	12 38 19.68	1.9989	6 22 12.6	9.873
9	11 03 36.62	2.0444	1 49 03.9	10.739	9	12 40 19.61	1.9987	6 32 03.9	9.836
10	11 05 39.23	2.0427	1 38 19.5	10.740	10	12 42 19.53	1.9986	6 41 52.9	9.798
11	11 07 41.74	2.0409	1 27 35.1	10.740	11	12 44 19.44	1.9985	6 51 39.7	9.761
12	11 09 44.14	2.0392	1 16 50.7	10.739	12	12 46 19.35	1.9984	7 01 24.2	9.722
13	11 11 46.44	2.0375	1 06 06.4	10.737	13	12 48 19.25	1.9983	7 11 06.3	9.682
14	11 13 48.64	2.0358	0 55 22.3	10.733	14	12 50 19.15	1.9983	7 20 46.0	9.642
15	11 15 50.74	2.0342	0 44 38.4	10.729	15	12 52 19.05	1.9983	7 30 23.1	9.602
16	11 17 52.75	2.0327	0 33 54.8	10.724	16	12 54 18.95	1.9983	7 39 58.2	9.560
17	11 19 54.67	2.0312	0 23 11.5	10.719	17	12 56 18.85	1.9984	7 49 30.5	9.517
18	11 21 56.49	2.0297	0 12 28.5	10.713	18	12 58 18.76	1.9985	7 59 00.3	9.475
19	11 23 58.23	2.0282	N. 0 01 45.9	10.705	19	13 00 18.67	1.9985	8 08 27.5	9.432
20	11 25 59.87	2.0267	S. 0 08 56.2	10.697	20	13 02 18.58	1.9987	8 17 52.1	9.388
21	11 28 01.44	2.0253	0 19 37.8	10.688	21	13 04 18.51	1.9989	8 27 14.1	9.343
22	11 30 02.92	2.0240	0 30 18.8	10.678	22	13 06 18.45	1.9990	8 36 33.3	9.297
23	11 32 04.32	2.0227	0 40 59.2	10.668	23	13 08 18.39	1.9992	8 45 49.8	9.252
24	11 34 05.64	+2.0214	S. 0 51 39.0	−10.657	24	13 10 18.35	+1.9995	S. 8 55 03.5	−9.205

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 25.

Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ' ")	Diff. for 1 Minute. (")
0	13 10 18.35	+ 1.9995	S. 8 55 03.5	− 9.205
1	13 12 18.33	1.9997	9 04 14.4	9.157
2	13 14 18.32	2.0000	9 13 22.4	9.110
3	13 16 18.33	2.0002	9 22 27.6	9.062
4	13 18 18.35	2.0006	9 31 29.8	9.012
5	13 20 18.40	2.0010	9 40 29.1	8.963
6	13 22 18.47	2.0014	9 49 25.4	8.912
7	13 24 18.57	2.0018	9 58 18.6	8.862
8	13 26 18.69	2.0022	10 07 08.8	8.811
9	13 28 18.83	2.0026	10 15 55.9	8.758
10	13 30 19.00	2.0031	10 24 39.8	8.705
11	13 32 19.20	2.0035	10 33 20.5	8.652
12	13 34 19.42	2.0040	10 41 58.0	8.598
13	13 36 19.68	2.0046	10 50 32.3	8.544
14	13 38 19.97	2.0051	10 59 03.3	8.489
15	13 40 20.29	2.0057	11 07 31.0	8.433
16	13 42 20.65	2.0062	11 15 55.3	8.377
17	13 44 21.04	2.0068	11 24 16.2	8.320
18	13 46 21.47	2.0074	11 32 33.7	8.262
19	13 48 21.93	2.0080	11 40 47.7	8.205
20	13 50 22.43	2.0087	11 48 58.3	8.147
21	13 52 22.98	2.0094	11 57 05.4	8.088
22	13 54 23.56	2.0100	12 05 08.9	8.028
23	13 56 24.18	+ 2.0107	S.12 13 08.8	− 7.968

WEDNESDAY 26.

Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ' ")	Diff. for 1 Minute. (")
0	13 58 24.85	+ 2.0115	S.12 21 05.1	− 7.908
1	14 00 25.56	2.0122	12 28 57.8	7.847
2	14 02 26.31	2.0129	12 36 46.8	7.786
3	14 04 27.11	2.0137	12 44 32.1	7.723
4	14 06 27.95	2.0144	12 52 13.6	7.661
5	14 08 28.84	2.0152	12 59 51.4	7.598
6	14 10 29.78	2.0160	13 07 25 4	7.535
7	14 12 30.76	2.0167	13 14 55.6	7.471
8	14 14 31.79	2.0176	13 22 21.9	7.407
9	14 16 32.87	2.0184	13 29 44.4	7.342
10	14 18 34.00	2.0192	13 37 02.9	7.276
11	14 20 35.18	2.0201	13 44 17.5	7.210
12	14 22 36.41	2.0209	13 51 28.1	7.143
13	14 24 37.69	2.0218	13 58 34.7	7.077
14	14 26 39.03	2.0227	14 05 37.3	7.010
15	14 28 40.42	2.0236	14 12 35.9	6.942
16	14 30 41.86	2.0245	14 19 30.4	6.873
17	14 32 43.36	2.0254	14 26 20.7	6.804
18	14 34 44.91	2.0263	14 33 06.9	6.736
19	14 36 46.52	2.0272	14 39 49.0	6.667
20	14 38 48.18	2.0282	14 46 26.9	6.596
21	14 40 49.90	2.0291	14 53 00.5	6.525
22	14 42 51.67	2.0300	14 59 29.9	6.454
23	14 44 53.50	2.0310	15 05 55.0	6.383
24	14 46 55.39	+ 2.0320	S.15 12 15.9	− 6.312

THURSDAY 27.

Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ' ")	Diff. for 1 Minute. (")
0	14 46 55.39	+ 2.0320	S.15 12 15.9	− 6.312
1	14 48 57.34	2.0329	15 18 32.5	6.240
2	14 50 59.34	2.0338	15 24 44.7	6.167
3	14 53 01.40	2.0347	15 30 52.6	6.094
4	14 55 03.51	2.0357	15 36 56.0	6.020
5	14 57 05.69	2.0368	15 42 55.0	5.947
6	14 59 07.93	2.0377	15 48 49.6	5.873
7	15 01 10.22	2.0387	15 54 39.8	5.799
8	15 03 12.57	2.0397	16 00 25.5	5.724
9	15 05 14.98	2.0407	16 06 06.7	5.648
10	15 07 17.45	2.0417	16 11 43.3	5.572
11	15 09 19.98	2.0426	16 17 15.4	5.497
12	15 11 22.56	2.0436	16 22 42.9	5.420
13	15 13 25.21	2.0447	16 28 05.8	5.343
14	15 15 27.92	2.0456	16 33 24.1	5.267
15	15 17 30.68	2.0466	16 38 37.8	5.189
16	15 19 33.51	2.0476	16 43 46.8	5.112
17	15 21 36.39	2.0485	16 48 51.2	5.034
18	15 23 39.33	2.0495	16 53 50.9	4.955
19	15 25 42.33	2.0505	16 58 45.8	4.876
20	15 27 45.39	2.0515	17 03 36.0	4.797
21	15 29 48.51	2.0525	17 08 21.4	4.717
22	15 31 51.69	2.0535	17 13 02.1	4.638
23	15 33 54.93	+ 2.0544	S.17 17 38.0	− 4.558

FRIDAY 28.

Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ' ")	Diff. for 1 Minute. (")
0	15 35 58.22	+ 2.0553	S.17 22 09.1	− 4.478
1	15 38 01.57	2.0563	17 26 35.4	4.397
2	15 40 04.98	2.0572	17 30 56.8	4.316
3	15 42 08.44	2.0582	17 35 13.3	4.234
4	15 44 11.96	2.0592	17 39 24.9	4.153
5	15 46 15.54	2.0601	17 43 31.7	4.072
6	15 48 19.17	2.0610	17 47 33.5	3.989
7	15 50 22.86	2.0619	17 51 30.4	3.907
8	15 52 26.60	2.0628	17 55 22.3	3.824
9	15 54 30.40	2.0637	17 59 09.3	3.742
10	15 56 34.25	2.0647	18 02 51.3	3.659
11	15 58 38.16	2.0655	18 06 28.4	3.576
12	16 00 42.11	2.0663	18 10 00.4	3.492
13	16 02 46.12	2.0673	18 13 27.4	3.408
14	16 04 50.19	2.0682	18 16 49.4	3.324
15	16 06 54.30	2.0690	18 20 06.3	3.239
16	16 08 58.47	2.0699	18 23 18.1	3.154
17	16 11 02.69	2.0707	18 26 24.8	3.069
18	16 13 06.96	2.0715	18 29 26.4	2.985
19	16 15 11.27	2.0723	18 32 23.0	2.900
20	16 17 15.64	2.0732	18 35 14.4	2.814
21	16 19 20.06	2.0740	18 38 00.7	2.728
22	16 21 24.52	2.0747	18 40 41.8	2.642
23	16 23 29.03	2.0755	18 43 17.8	2.557
24	16 25 33.58	+ 2.0762	S.18 45 48.6	− 2.470

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
			SATURDAY 29.					**MONDAY 31.**	
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 25 33.58	+ 2.0762	S.18 45 48.6	− 2.470	0	18 05 52.49	+ 2.0986	S.19 02 33.1	+ 1.799
1	16 27 38.18	2.0771	18 48 14.2	2.383	1	18 07 58.41	2.0987	19 00 42.5	1.889
2	16 29 42.83	2.0778	18 50 34.6	2.297	2	18 10 04.33	2.0987	18 58 46.4	1.979
3	16 31 47.52	2.0786	18 52 49.9	2.211	3	18 12 10.26	2.0989	18 56 45.0	2.068
4	16 33 52.26	2.0793	18 54 59.9	2.123	4	18 14 16.20	2.0990	18 54 38.2	2.158
5	16 35 57.04	2.0800	18 57 04.7	2.036	5	18 16 22.14	2.0991	18 52 26.0	2.247
6	16 38 01.86	2.0807	18 59 04.2	1.948	6	18 18 28.09	2.0992	18 50 08.5	2.337
7	16 40 06.72	2.0813	19 00 58.5	1.862	7	18 20 34.05	2.0993	18 47 45.6	2.426
8	16 42 11.62	2.0821	19 02 47.6	1.774	8	18 22 40.01	2.0994	18 45 17.4	2.515
9	16 44 16.57	2.0827	19 04 31.4	1.686	9	18 24 45.98	2.0995	18 42 43.8	2.604
10	16 46 21.55	2.0833	19 06 09.9	1.597	10	18 26 51.95	2.0996	18 40 04.9	2.693
11	16 48 26.57	2.0840	19 07 43.1	1.510	11	18 28 57.93	2.0996	18 37 20.6	2.782
12	16 50 31.63	2.0847	19 09 11.1	1.422	12	18 31 03.90	2.0996	18 34 31.0	2.871
13	16 52 36.73	2.0852	19 10 33.8	1.333	13	18 33 09.88	2.0997	18 31 36.1	2.960
14	16 54 41.86	2.0858	19 11 51.1	1.245	14	18 35 15.86	2.0997	18 28 35.8	3.049
15	16 56 47.03	2.0864	19 13 03.2	1.157	15	18 37 21.85	2.0997	18 25 30.2	3.137
16	16 58 52.23	2.0870	19 14 10.0	1.068	16	18 39 27.83	2.0997	18 22 19.3	3.226
17	17 00 57.47	2.0876	19 15 11.4	0.979	17	18 41 33.82	2.0998	18 19 03.1	3.314
18	17 03 02.74	2.0881	19 16 07.5	0.891	18	18 43 39.81	2.0998	18 15 41.6	3.402
19	17 05 08.04	2.0886	19 16 58.3	0.802	19	18 45 45.79	2.0998	18 12 14.8	3.490
20	17 07 13.37	2.0892	19 17 43.7	0.712	20	18 47 51.78	2.0998	18 08 42.8	3.577
21	17 09 18.74	2.0897	19 18 23.8	0.623	21	18 49 57.77	2.0997	18 05 05.5	3.666
22	17 11 24.14	2.0902	19 18 58.5	0.534	22	18 52 03.75	2.0997	18 01 22.9	3.753
23	17 13 29.57	+ 2.0907	S.19 19 27.9	− 0.445	23	18 54 09.74	+ 2.0997	S.17 57 35.1	+ 3.841
			SUNDAY 30.					**TUESDAY, APRIL 1.**	
0	17 15 35.03	+ 2.0912	S.19 19 51.9	− 0.355	0	18 56 15.72	+ 2.0997	S.17 53 42.0	+ 3.928
1	17 17 40.51	2.0916	19 20 10.5	0.266					
2	17 19 46.02	2.0921	19 20 23.8	0.177					
3	17 21 51.56	2.0925	19 20 31.7	− 0.087					
4	17 23 57.12	2.0929	19 20 34.3	+ 0.002					
5	17 26 02.71	2.0933	19 20 31.4	0.092					
6	17 28 08.32	2.0937	19 20 23.2	0.182					
7	17 30 13.95	2.0941	19 20 09.6	0.272					
8	17 32 19.61	2.0945	19 19 50.6	0.362					
9	17 34 25.29	2.0948	19 19 26.2	0.452					
10	17 36 30.99	2.0952	19 18 56.4	0.542					
11	17 38 36.71	2.0955	19 18 21.2	0.631					
12	17 40 42.45	2.0958	19 17 40.7	0.721					
13	17 42 48.21	2.0961	19 16 54.7	0.812					
14	17 44 53.98	2.0963	19 16 03.3	0.901					
15	17 46 59.77	2.0966	19 15 06.6	0.990					
16	17 49 05.57	2.0968	19 14 04.5	1.081					
17	17 51 11.39	2.0971	19 12 56.9	1.171					
18	17 53 17.22	2.0973	19 11 44.0	1.261					
19	17 55 23.07	2.0976	19 10 25.6	1.351					
20	17 57 28.93	2.0977	19 09 01.9	1.440					
21	17 59 34.80	2.0980	19 07 32.8	1.530					
22	18 01 40.69	2.0982	19 05 58.3	1.620					
23	18 03 46.58	2.0983	19 04 18.4	1.710					
24	18 05 52.49	+ 2.0986	S.19 02 33.1	+ 1.799					

PHASES OF THE MOON.

			d	h	m
☾	Last Quarter . .	March	1	22	39.4
●	New Moon		9	14	50.2
☽	First Quarter		16	10	12.8
○	Full Moon		23	15	21.3
☾	Last Quarter		31	18	24.0

				d	h
☾	Apogee	March		1	08.8
☾	Perigee			13	08.6
☾	Apogee			29	04.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Noon.	P.L. of Diff.	III^h.	P.L. of Diff.	VI^h.	P.L. of Diff.	IX^h.	P.L. of Diff.
1	Regulus	W.	91 16 59	3087	92 45 25	3088	94 13 49	3088	95 42 13	3089
	Spica	W.	37 30 52	3070	38 59 38	3072	40 28 22	3072	41 57 06	3072
	SATURN	E.	54 34 33	3128	53 06 57	3130	51 39 25	3132	50 11 54	3133
	a Aquilæ	E.	63 33 18	3586	62 14 28	3602	60 55 56	3618	59 37 41	3635
	JUPITER	E.	65 18 52	3173	63 52 10	3175	62 25 31	3176	60 58 53	3177
	VENUS	E.	78 19 06	2986	76 48 36	2989	75 18 10	2992	73 47 47	2994
	SUN	E.	100 11 56	3466	98 50 54	3468	97 29 54	3468	96 08 54	3468
2	Regulus	W.	103 04 16	3084	104 32 46	3081	106 01 19	3078	107 29 55	3074
	Spica	W.	49 20 57	3065	50 49 49	3063	52 18 44	3059	53 47 44	3056
	SATURN	E.	42 54 36	3134	41 27 08	3134	39 59 40	3133	38 32 11	3132
	a Aquilæ	E.	53 11 24	3738	51 55 17	3763	50 39 36	3790	49 24 23	3820
	JUPITER	E.	53 45 50	3175	52 19 11	3173	50 52 30	3172	49 25 47	3170
	VENUS	E.	66 16 19	2997	64 46 02	2997	63 15 45	2995	61 45 26	2993
	SUN	E.	89 23 44	3460	88 02 36	3457	86 41 24	3454	85 20 08	3450
3	Regulus	W.	114 54 11	3051	116 23 21	3045	117 52 38	3039	119 22 03	3031
	Spica	W.	61 14 03	3030	62 43 39	3023	64 13 23	3016	65 43 16	3008
	SATURN	E.	31 14 22	3126	29 46 44	3125	28 19 05	3124	26 51 25	3125
	JUPITER	E.	42 11 22	3153	40 44 16	3149	39 17 06	3145	37 49 51	3141
	VENUS	E.	54 13 04	2977	52 42 23	2972	51 11 36	2967	49 40 42	2962
	SUN	E.	78 32 29	3422	77 10 37	3414	75 48 36	3407	74 26 27	3398
4	Spica	W.	73 15 13	2964	74 46 11	2954	76 17 21	2944	77 48 44	2933
	Antares	W.	28 31 54	3115	29 59 45	3092	31 28 04	3070	32 56 50	3050
	VENUS	E.	42 04 23	2929	40 32 41	2922	39 00 50	2913	37 28 48	2905
	SUN	E.	67 33 12	3351	66 09 59	3340	64 46 34	3329	63 22 56	3318
5	Spica	W.	85 29 14	2874	87 02 06	2862	88 35 14	2848	90 08 39	2835
	Antares	W.	40 26 45	2957	41 57 52	2939	43 29 22	2921	45 01 14	2904
	VENUS	E.	29 45 51	2859	28 12 40	2849	26 39 16	2840	25 05 40	2831
	SUN	E.	56 21 19	3255	54 56 15	3242	53 30 55	3228	52 05 19	3214
6	Spica	W.	98 00 07	2766	99 35 20	2752	101 10 51	2738	102 46 41	2722
	Antares	W.	52 45 58	2821	54 19 59	2804	55 54 22	2788	57 29 06	2771
	SUN	E.	44 53 06	3142	43 25 48	3127	41 58 11	3113	40 30 17	3099
7	Spica	W.	110 50 49	2649	112 28 38	2634	114 06 47	2618	115 45 17	2604
	Antares	W.	65 28 10	2690	67 05 03	2675	68 42 17	2659	70 19 52	2643
	SUN	E.	33 06 24	3027	31 36 45	3014	30 06 50	3001	28 36 38	2989
11	SUN	W.	18 11 44	2676	19 48 56	2654	21 26 38	2636	23 04 44	2621
	Aldebaran	E.	60 48 49	2275	59 02 13	2269	57 15 28	2264	55 28 36	2259
	Pollux	E.	103 26 29	2366	101 42 05	2357	99 57 29	2350	98 12 43	2345
12	SUN	W.	31 19 08	2577	32 58 34	2572	34 38 08	2567	36 17 49	2562
	Aldebaran	E.	46 32 36	2241	44 45 10	2239	42 57 40	2237	41 10 08	2236
	Pollux	E.	89 27 00	2324	87 41 35	2321	85 56 06	2319	84 10 34	2317
13	SUN	W.	44 37 25	2551	46 17 28	2550	47 57 31	2549	49 37 36	2550
	Pollux	E.	75 22 43	2320	73 37 12	2322	71 51 45	2325	70 06 22	2328
	Regulus	E.	111 51 56	2242	110 04 31	2241	108 17 05	2242	106 29 40	2243

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Regulus	W.	97 10 36	3089	98 38 59	3088	100 07 23	3087	101 35 49	3086
	Spica	W.	43 25 50	3072	44 54 34	3070	46 23 20	3069	47 52 07	3067
	SATURN	E .	48 44 25	3134	47 15 57	3135	45 49 30	3135	44 22 03	3135
	a Aquilæ	E .	58 19 45	3653	57 02 08	3672	55 44 51	3693	54 27 56	3714
	JUPITER	E .	59 32 16	3178	58 05 40	3178	56 39 04	3177	55 12 27	3175
	VENUS	E .	72 17 27	2996	70 47 09	2997	69 16 52	2997	67 46 35	2997
	SUN	E .	94 47 54	3468	93 26 54	3467	92 05 53	3465	90 44 50	3463
2	Regulus	W.	108 58 36	3070	110 27 21	3066	111 56 12	3062	113 25 08	3056
	Spica	W.	55 16 48	3052	56 45 57	3047	58 15 12	3041	59 44 34	3035
	SATURN	E .	37 04 40	3131	35 37 08	3130	34 09 34	3129	32 41 59	3127
	a Aquilæ	E .	48 09 42	3853	46 55 34	3888	45 42 02	3926	44 29 09	3969
	JUPITER	E .	47 59 01	3167	46 32 12	3163	45 05 19	3160	43 38 23	3157
	VENUS	E .	60 15 04	2991	58 44 40	2988	57 14 12	2985	55 43 40	2981
	SUN	E .	83 58 48	3446	82 37 23	3440	81 15 52	3434	79 54 14	3428
3	Regulus	W.	120 51 37	3025	122 21 19	3018	123 51 10	3009	125 21 12	3000
	Spica	W.	67 13 19	3001	68 43 31	2992	70 13 54	2983	71 44 28	2974
	SATURN	E .	25 23 46	3129	23 56 11	3133	22 28 41	3137	21 01 15	3141
	JUPITER	E .	36 22 31	3137	34 55 06	3133	33 27 36	3129	32 00 02	3126
	VENUS	E .	48 09 42	2956	46 38 34	2950	45 07 19	2943	43 35 55	2936
	SUN	E .	73 04 08	3390	71 41 40	3381	70 19 02	3371	68 56 13	3361
4	Spica	W.	79 20 21	2922	80 52 12	2911	82 24 17	2898	83 56 38	2887
	Antares	W.	34 26 01	3030	35 55 36	3011	37 25 36	2992	38 55 59	2973
	VENUS	E .	35 56 35	2896	34 24 11	2887	32 51 36	2879	31 18 50	2869
	SUN	E .	61 59 05	3306	60 35 00	3294	59 10 41	3281	57 46 07	3268
5	Spica	W.	91 42 21	2821	93 16 21	2808	94 50 38	2795	96 25 13	2780
	Antares	W.	46 33 28	2887	48 06 03	2870	49 39 00	2854	51 12 18	2837
	VENUS	E .	23 31 53	2822	21 57 54	2813	20 23 43	2804	18 49 20	2794
	SUN	E .	50 39 26	3200	49 13 16	3186	47 46 50	3172	46 20 07	3157
6	Spica	W.	104 22 51	2707	105 59 21	2693	107 36 10	2678	109 13 20	2663
	Antares	W.	59 04 12	2755	60 39 39	2738	62 15 28	2722	63 51 38	2706
	SUN	E .	39 02 06	3084	37 33 37	3069	36 04 50	3055	34 35 45	3041
7	Spica	W.	117 24 07	2590	119 03 16	2574	120 42 46	2560	122 22 36	2544
	Antares	W.	71 57 49	2627	73 36 07	2612	75 14 45	2596	76 53 45	2582
	SUN	E :	27 06 12	2978	25 35 32	2968	24 04 40	2958	22 33 35	2949
11	SUN	W.	24 43 10	2610	26 21 51	2601	28 00 45	2592	29 39 51	2584
	Aldebaran	E .	53 41 36	2255	51 54 30	2251	50 07 17	2247	48 19 59	2243
	Pollux	E .	96 27 49	2339	94 42 47	2334	92 57 37	2330	91 12 21	2326
12	SUN	W.	37 57 36	2559	39 37 28	2556	41 17 24	2553	42 57 23	2551
	Aldebaran	E .	39 22 34	2235	37 34 59	2235	35 47 24	2236	33 59 49	2237
	Pollux	E .	82 25 00	2317	80 39 26	2317	78 53 51	2317	77 08 17	2318
13	SUN	W.	51 17 40	2551	52 57 43	2551	54 37 45	2553	56 17 45	2555
	Pollux	E .	68 21 03	2332	66 35 50	2337	64 50 45	2342	63 05 47	2348
	Regulus	E .	104 42 16	2244	102 54 54	2245	101 07 33	2247	99 20 15	2249

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
14	Sun	W.	57 57 42	2557	59 37 36	2560	61 17 26	2563	62 57 13	2566
	Pollux	E.	61 20 57	2355	59 36 17	2362	57 51 48	2370	56 07 30	2379
	Regulus	E.	97 33 00	2251	95 45 49	2254	93 58 42	2257	92 11 39	2260
15	Sun	W.	71 14 55	2585	72 54 10	2590	74 33 19	2594	76 12 22	2599
	a Arietis	W.	31 25 22	2505	33 06 28	2489	34 47 56	2475	36 29 44	2463
	Pollux	E.	47 29 40	2438	45 47 00	2454	44 04 42	2471	42 22 48	2490
	Regulus	E.	83 17 43	2280	81 31 14	2285	79 44 53	2290	77 58 38	2295
16	Sun	W.	84 25 50	2627	86 04 08	2632	87 42 19	2638	89 20 22	2645
	a Arietis	W.	45 01 56	2434	46 44 42	2432	48 27 31	2431	50 10 21	2431
	Regulus	E.	69 09 22	2323	67 23 56	2329	65 38 39	2335	63 53 31	2342
	Spica	E.	122 50 04	2302	121 04 08	2308	119 18 21	2314	117 32 42	2320
17	Sun	W.	97 28 28	2677	99 05 39	2684	100 42 41	2690	102 19 34	2697
	a Arietis	W.	58 44 17	2440	60 26 55	2443	62 09 28	2446	63 51 57	2450
	Aldebaran	W.	24 58 25	2373	26 42 39	2377	28 26 47	2381	30 10 49	2385
	Regulus	E.	55 10 18	2376	53 26 09	2384	51 42 12	2392	49 58 26	2400
	Spica	E.	108 46 36	2350	107 01 49	2357	105 17 12	2363	103 32 44	2368
18	Sun	W.	110 21 41	2732	111 57 38	2739	113 33 26	2746	115 09 05	2753
	a Arietis	W.	72 22 50	2474	74 04 40	2480	75 46 22	2485	77 27 57	2491
	Aldebaran	W.	38 49 17	2412	40 32 35	2418	42 15 44	2424	43 58 45	2429
	Regulus	E.	41 22 31	2444	39 39 58	2454	37 57 40	2464	36 15 36	2475
	Spica	E.	94 52 37	2401	93 09 04	2408	91 25 41	2415	89 42 27	2421
19	Sun	W.	123 04 50	2792	124 39 29	2800	126 13 57	2807	127 48 16	2815
	a Arietis	W.	85 53 44	2522	87 34 26	2529	89 14 59	2536	90 55 22	2543
	Aldebaran	W.	52 31 38	2462	54 13 44	2469	55 55 41	2475	57 37 29	2482
	Spica	E.	81 08 41	2456	79 26 26	2463	77 44 20	2470	76 02 24	2477
	Antares	E.	126 22 56	2510	124 41 56	2515	123 01 04	2520	121 20 19	2525
20	a Arietis	W.	99 14 42	2583	100 54 01	2591	102 33 09	2599	104 12 05	2607
	Aldebaran	W.	66 04 00	2518	67 44 48	2526	69 25 25	2533	71 05 52	2540
	Spica	E.	67 35 18	2514	65 54 24	2521	64 13 40	2529	62 33 07	2536
	Antares	E.	112 58 30	2556	111 18 34	2562	109 38 47	2569	107 59 09	2576
21	Aldebaran	W.	79 25 29	2580	81 04 51	2588	82 44 02	2596	84 23 02	2604
	Pollux	W.	38 02 59	2817	39 37 05	2809	41 11 21	2803	42 45 45	2798
	Spica	E.	54 13 03	2576	52 33 35	2585	50 54 19	2593	49 15 14	2601
	Antares	E.	99 43 26	2613	98 04 48	2621	96 26 22	2629	94 48 06	2637
22	Aldebaran	W.	92 35 10	2648	94 13 00	2657	95 50 38	2666	97 28 05	2675
	Pollux	W.	50 38 39	2795	52 13 13	2798	53 47 43	2801	55 22 10	2805
	Spica	E.	41 02 46	2645	39 24 52	2654	37 47 10	2663	36 09 40	2672
	Antares	E.	86 39 36	2680	85 02 29	2689	83 25 35	2698	81 48 53	2707
23	Aldebaran	W.	105 32 12	2721	107 08 24	2731	108 44 23	2740	110 20 10	2750
	Pollux	W.	63 12 58	2831	64 46 46	2838	66 20 25	2844	67 53 56	2851
	Regulus	E.	26 11 08	2805	27 45 30	2806	29 19 50	2808	30 54 07	2811
	Spica	E.	28 05 16	2719	26 29 02	2729	24 53 00	2739	23 17 11	2749
	Antares	E.	73 48 32	2756	72 13 07	2766	70 37 55	2777	69 02 57	2787

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVʰ.	P. L. of Diff.	XVIIIʰ.	P. L. of Diff.	XXIʰ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
14	Sun	W.	64 36 55	2569	66 16 33	2573	67 56 05	2576	69 35 33	2580
	Pollux	E.	54 23 25	2389	52 39 34	2400	50 55 59	2412	49 12 41	2424
	Regulus	E.	90 24 40	2264	88 37 47	2268	86 51 00	2272	85 04 18	2276
15	Sun	W.	77 51 18	2604	79 30 07	2610	81 08 49	2615	82 47 23	2621
	α Arietis	W.	38 11 49	2453	39 54 08	2446	41 36 37	2441	43 19 14	2437
	Pollux	E.	40 41 21	2512	39 00 24	2535	37 20 00	2561	35 40 11	2590
	Regulus	E.	76 12 31	2300	74 26 32	2305	72 40 40	2311	70 54 57	2317
16	Sun	W.	90 58 16	2651	92 36 02	2657	94 13 39	2663	95 51 08	2670
	α Arietis	W.	51 53 12	2432	53 36 01	2433	55 18 49	2435	57 01 35	2437
	Regulus	E.	62 08 33	2349	60 23 45	2355	58 39 06	2362	56 54 37	2369
	Spica	E.	115 47 12	2326	114 01 50	2332	112 16 37	2338	110 31 32	2344
17	Sun	W.	103 56 18	2704	105 32 53	2711	107 09 18	2718	108 45 34	2725
	α Arietis	W.	65 34 20	2455	67 16 37	2459	68 58 48	2464	70 40 52	2469
	Aldebaran	W.	31 54 45	2390	33 38 34	2395	35 22 16	2400	37 05 50	2405
	Regulus	E.	48 14 51	2408	46 31 28	2416	44 48 16	2425	43 05 17	2434
	Spica	E.	101 48 24	2375	100 04 13	2382	98 20 12	2388	96 36 20	2394
18	Sun	W.	116 44 34	2761	118 19 53	2769	119 55 02	2776	121 30 01	2784
	α Arietis	W.	79 09 24	2497	80 50 42	2503	82 31 51	2509	84 12 52	2515
	Aldebaran	W.	45 41 38	2436	47 24 22	2442	49 06 56	2448	50 49 22	2455
	Regulus	E.	34 33 47	2487	32 52 15	2499	31 11 01	2512	29 30 05	2527
	Spica	E.	87 59 22	2428	86 16 27	2435	84 33 42	2442	82 51 07	2449
19	Sun	W.	129 22 24	2824	130 56 21	2832	132 30 08	2840	134 03 44	2848
	α Arietis	W.	92 35 35	2551	94 15 38	2559	95 55 30	2566	97 35 11	2574
	Aldebaran	W.	59 19 07	2489	61 00 35	2496	62 41 53	2503	64 23 02	2511
	Spica	E.	74 20 38	2485	72 39 03	2492	70 57 38	2499	69 16 23	2506
	Antares	E.	119 39 41	2531	117 59 11	2537	116 18 49	2543	114 38 35	2549
20	α Arietis	W.	105 50 50	2617	107 29 22	2626	109 07 41	2635	110 45 48	2645
	Aldebaran	W.	72 46 09	2548	74 26 15	2556	76 06 10	2564	77 45 55	2572
	Spica	E.	60 52 44	2544	59 12 32	2552	57 32 32	2560	55 52 42	2568
	Antares	E.	106 19 40	2583	104 40 21	2590	103 01 13	2597	101 22 14	2605
21	Aldebaran	W.	86 01 51	2613	87 40 28	2621	89 18 54	2630	90 57 08	2639
	Pollux	W.	44 20 16	2795	45 54 50	2794	47 29 26	2793	49 04 03	2794
	Spica	E.	47 36 20	2610	45 57 39	2619	44 19 10	2627	42 40 52	2636
	Antares	E.	93 10 01	2645	91 32 07	2654	89 54 25	2663	88 16 55	2671
22	Aldebaran	W.	99 05 19	2684	100 42 21	2693	102 19 10	2702	103 55 47	2711
	Pollux	W.	56 56 32	2809	58 30 48	2814	60 04 58	2819	61 39 02	2825
	Spica	E.	34 32 22	2681	32 55 17	2690	31 18 24	2699	29 41 43	2709
	Antares	E.	80 12 23	2717	78 36 06	2727	77 00 02	2737	75 24 11	2746
23	Aldebaran	W.	111 55 44	2760	113 31 05	2769	115 06 14	2779	116 41 10	2788
	Pollux	W.	69 27 18	2859	71 00 30	2866	72 33 33	2874	74 06 26	2882
	Regulus	W.	32 28 21	2815	34 02 30	2820	35 36 32	2825	37 10 28	2831
	Spica	E.	21 41 36	2759	20 06 15	2769	18 31 07	2780	16 56 12	2791
	Antares	E.	67 28 12	2798	65 53 42	2808	64 19 25	2819	62 45 22	2830

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIʰ.	P. L. of Diff.	VIʰ.	P. L. of Diff.	IXʰ.	P. L. of Diff.
23	SATURN E.	121 41 49	2763	120 06 33	2772	118 31 28	2780	116 56 34	2789
24	Pollux W.	75 39 08	2890	77 11 40	2899	78 44 00	2907	80 16 10	2916
	Regulus W.	38 44 16	2838	40 17 55	2845	41 51 25	2852	43 24 46	2859
	Antares E.	61 11 33	2841	59 37 58	2853	58 04 39	2864	56 31 34	2875
	SATURN E.	109 05 03	2835	107 31 21	2845	105 57 51	2854	104 24 33	2863
	JUPITER E.	122 29 32	2886	120 56 55	2894	119 24 29	2903	117 52 14	2912
25	Pollux W.	87 54 10	2961	89 25 12	2971	90 56 01	2980	92 26 39	2989
	Regulus W.	51 09 06	2898	52 41 27	2906	54 13 38	2915	55 45 38	2923
	Antares E.	48 49 54	2936	47 18 21	2949	45 47 04	2962	44 16 03	2975
	SATURN E.	96 41 01	2910	95 08 55	2919	93 37 00	2928	92 05 17	2937
	JUPITER E.	110 13 52	2957	108 42 46	2966	107 11 51	2975	105 41 07	2984
26	Pollux W.	99 56 54	3036	101 26 22	3046	102 55 38	3055	104 24 43	3065
	Regulus W.	63 23 06	2963	64 54 05	2971	66 24 54	2978	67 55 34	2985
	Antares E.	36 45 21	3049	35 16 09	3066	33 47 18	3084	32 18 48	3103
	SATURN E.	84 29 32	2981	82 58 56	2990	81 28 31	2998	79 58 16	3006
	JUPITER E.	98 10 13	3027	96 40 34	3036	95 11 06	3044	93 41 47	3052
27	Pollux W.	111 47 14	3110	113 15 11	3120	114 42 56	3129	116 10 31	3138
	Regulus W.	75 26 36	3021	76 56 22	3028	78 26 00	3034	79 55 31	3040
	Spica W.	21 37 59	3006	23 08 04	3012	24 38 01	3018	26 07 51	3024
	SATURN E.	72 29 28	3045	71 00 11	3052	69 31 02	3058	68 02 01	3065
	JUPITER E.	86 17 36	3089	84 49 13	3096	83 20 58	3102	81 52 51	3108
	VENUS E.	100 16 05	3231	98 50 33	3239	97 25 10	3247	95 59 56	3254
28	Regulus W.	87 21 23	3065	88 50 15	3069	90 19 02	3073	91 47 44	3077
	Spica W.	33 35 23	3049	35 04 35	3053	36 33 42	3056	38 02 45	3060
	SATURN E.	60 38 50	3093	59 10 32	3099	57 42 21	3103	56 14 15	3107
	JUPITER E.	74 34 04	3136	73 06 38	3140	71 39 18	3144	70 12 02	3148
	VENUS E.	88 55 49	3287	87 31 22	3293	86 07 02	3298	84 42 47	3302
	SUN E.	131 00 12	3431	129 38 30	3435	128 16 53	3438	126 55 20	3442
29	Regulus W.	99 10 18	3090	100 38 40	3091	102 07 01	3091	103 35 21	3091
	Spica W.	45 27 04	3072	46 55 48	3073	48 24 31	3073	49 53 14	3073
	SATURN E.	48 54 56	3125	47 27 16	3128	45 59 40	3130	44 32 06	3132
	JUPITER E.	62 56 46	3163	61 29 53	3165	60 03 02	3166	58 36 12	3168
	VENUS E.	77 42 48	3320	76 19 00	3322	74 55 14	3324	73 31 30	3325
	SUN E.	120 08 25	3454	118 47 09	3454	117 25 54	3454	116 04 39	3455
30	Regulus W.	110 57 02	3089	112 25 25	3087	113 53 51	3084	115 22 20	3081
	Spica W.	57 16 51	3068	58 45 39	3065	60 14 31	3063	61 43 26	3060
	SATURN E.	37 14 51	3139	35 47 29	3141	34 20 09	3142	32 52 50	3143
	JUPITER E.	51 22 18	3168	49 55 30	3167	48 28 42	3166	47 01 52	3164
	VENUS E.	66 33 04	3325	65 09 21	3323	63 45 37	3321	62 21 50	3319
	SUN E.	109 18 19	3449	107 56 58	3446	106 35 33	3442	105 14 04	3438
31	Spica W.	69 09 15	3036	70 38 43	3030	72 08 19	3023	73 38 03	3016
	JUPITER E.	39 47 07	3153	38 20 02	3150	36 52 53	3147	35 25 40	3145
	VENUS E.	55 22 03	3299	53 57 51	3294	52 33 33	3288	51 09 07	3282
	SUN E.	98 25 26	3412	97 03 23	3405	95 41 13	3398	94 18 54	3391

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVʰ.	P. L. of Diff.	XVIIIʰ.	P. L. of Diff.	XXIʰ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
23	SATURN	E.	115 21 52	2798	113 47 22	2808	112 13 04	2817	110 38 58	2826
24	Pollux	W.	81 48 09	2925	83 19 56	2934	84 51 32	2943	86 22 57	2952
	Regulus	W.	44 57 58	2866	46 31 00	2874	48 03 52	2882	49 36 34	2890
	Antares	E.	54 58 43	2887	53 26 08	2899	51 53 48	2911	50 21 43	2924
	SATURN	E.	102 51 26	2873	101 18 32	2882	99 45 50	2891	98 13 20	2900
	JUPITER	E.	116 20 11	2921	114 48 19	2930	113 16 39	2939	111 45 10	2948
25	Pollux	W.	93 57 06	2999	95 27 20	3008	96 57 23	3018	98 27 14	3027
	Regulus	W.	57 17 28	2931	58 49 07	2939	60 20 37	2947	61 51 56	2955
	Antares	E.	42 45 19	2989	41 14 53	3003	39 44 44	3018	38 14 53	3033
	SATURN	E.	90 33 45	2946	89 02 25	2955	87 31 17	2964	86 00 19	2973
	JUPITER	E.	104 10 35	2993	102 40 13	3002	101 10 03	3010	99 40 03	3018
26	Pollux	W.	105 53 36	3074	107 22 17	3083	108 50 47	3092	110 19 06	3101
	Regulus	W.	69 26 05	2993	70 56 26	3001	72 26 38	3008	73 56 41	3014
	Antares	E.	30 50 42	3124	29 23 02	3147	27 55 49	3171	26 29 05	3197
	SATURN	E.	78 28 11	3014	76 58 16	3022	75 28 31	3030	73 58 55	3037
	JUPITER	E.	92 12 38	3060	90 43 39	3067	89 14 49	3074	87 46 08	3082
27	Pollux	W.	117 37 54	3148	119 05 06	3157	120 32 07	3166	121 58 57	3173
	Regulus	W.	81 24 55	3046	82 54 11	3051	84 23 21	3056	85 52 25	3060
	Spica	W.	27 37 35	3030	29 07 11	3034	30 36 41	3039	32 06 05	3044
	SATURN	E.	66 33 08	3071	65 04 23	3077	63 35 45	3082	62 07 14	3088
	JUPITER	E.	80 24 52	3114	78 57 00	3120	77 29 15	3125	76 01 36	3131
	VENUS	E.	94 34 50	3261	93 09 53	3268	91 45 05	3275	90 20 24	3281
28	Regulus	W.	93 16 22	3080	94 44 56	3083	96 13 26	3086	97 41 53	3088
	Spica	W.	39 31 43	3064	41 00 37	3066	42 29 29	3068	43 58 18	3070
	SATURN	E.	54 46 14	3111	53 18 18	3115	51 50 27	3119	50 22 40	3122
	JUPITER	E.	68 44 51	3152	67 17 45	3155	65 50 42	3158	64 23 42	3161
	VENUS	E.	83 18 38	3306	81 54 34	3310	80 30 35	3314	79 06 40	3317
	SUN	E.	125 33 51	3445	124 12 25	3448	122 51 03	3450	121 29 43	3452
29	Regulus	W.	105 03 41	3092	106 32 00	3091	108 00 20	3091	109 28 40	3090
	Spica	W.	51 21 56	3073	52 50 38	3073	54 19 21	3072	55 48 05	3070
	SATURN	E.	43 04 35	3133	41 37 06	3135	40 09 39	3137	38 42 14	3138
	JUPITER	E.	57 09 24	3168	55 42 37	3169	54 15 51	3169	52 49 05	3168
	VENUS	E.	72 07 48	3326	70 44 07	3326	69 20 26	3326	67 56 45	3326
	SUN	E.	114 43 25	3454	113 22 10	3454	112 00 55	3453	110 39 38	3451
30	Regulus	W.	116 50 52	3078	118 19 28	3074	119 48 09	3070	121 16 54	3066
	Spica	W.	63 12 25	3056	64 41 29	3052	66 10 38	3047	67 39 53	3041
	SATURN	E.	31 25 32	3145	29 58 17	3147	28 31 04	3150	27 03 54	3153
	JUPITER	E.	45 34 59	3162	44 08 05	3160	42 41 08	3158	41 14 09	3156
	VENUS	E.	60 58 01	3316	59 34 08	3313	58 10 11	3309	56 46 10	3305
	SUN	E.	103 52 31	3434	102 30 54	3429	101 09 11	3424	99 47 22	3418
31	Spica	W.	75 07 56	3003	76 37 58	2999	78 08 11	2991	79 38 34	2982
	JUPITER	E.	33 58 25	3143	32 31 07	3141	31 03 47	3139	29 36 24	3137
	VENUS	E.	49 44 34	3275	48 19 53	3268	46 55 04	3259	45 30 05	3250
	SUN	E.	92 56 27	3382	91 33 50	3373	90 11 03	3364	88 48 05	3354

		AT GREENWICH APPARENT NOON.								
Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian	Equation of Time, to be Added to	
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour	Semi-diameter.			Subtracted from Apparent Time.	Diff. for 1 Hour.
		h　m　s	s	°　′　″	″	′　″		s	m　s	s
Tues.	1	0　39　49.21	+ 9.099	N. 4　17　19.3	+ 57.98	16　01.18		64.41	4　10.13	0.757
Wed.	2	0　43　27.61	9.104	4　40　28.4	57.78	16　00.90		64.43	3　52.03	0.752
Thur.	3	0　47　06.14	9.110	5　03　32.6	57.57	16　00.62		64.45	3　34.06	0.746
Frid.	4	0　50　44.83	+ 9.116	5　26　31.5	+ 57.34	16　00.34		64.47	3　16.24	0.739
Sat.	5	0　54　23.69	9.123	5　49　24.8	57.10	16　00.06		64.49	2　58.59	0.732
SUN.	6	0　58　02.71	9.130	6　12　12.0	56.84	15　59.79		64.52	2　41.11	0.724
Mon.	7	1　01　41.95	+ 9.139	6　34　52.8	+ 56.56	15　59.51		64.55	2　23.84	0.715
Tues.	8	1　05　21.39	9.148	6　57　26.9	56.27	15　59.24		64.59	2　06.79	0.706
Wed.	9	1　09　01.07	9.158	7　19　53.9	55.97	15　58.97		64.63	1　49.96	0.696
Thur.	10	1　12　40.97	+ 9.168	7　42　13.4	+ 55.65	15　58.70		64.67	1　33.36	0.686
Frid.	11	1　16　21.14	9.179	8　04　25.2	55.32	15　58.42		64.71	1　17.02	0.675
Sat.	12	1　20　01.57	9.190	8　26　28.7	54.97	15　58.15		64.75	1　00.94	0.664
SUN.	13	1　23　42.28	+ 9.202	8　48　23.8	+ 54.61	15　57.88		64.79	0　45.14	0.652
Mon.	14	1　27　23.27	9.215	9　10　09.9	54.23	15　57.61		64.83	0　29.61	0.640
Tues.	15	1　31　04.59	9.228	9　31　47.0	53.84	15　57.34		64.88	0　14.42	0.627
Wed.	16	1　34　46.22	+ 9.242	9　53　14.4	+ 53.44	15　57.08		64.93	0　00.46	0.613
Thur.	17	1　38　28.19	9.256	10　14　31.9	53.02	15　56.81		64.98	0　15.01	0.599
Frid.	18	1　42　10.52	9.271	10　35　39.3	52.59	15　56.55		65.04	0　29.20	0.584
Sat.	19	1　45　53.21	+ 9.287	10　56　36.2	+ 52.14	15　56.29		65.10	0　43.01	0.568
SUN.	20	1　49　36.30	9.304	11　17　22.2	51.68	15　56.03		65.16	0　56.43	0.551
Mon.	21	1　53　19.79	9.321	11　37　57.1	51.21	15　55.77		65.22	1　09.46	0.534
Tues.	22	1　57　03.71	+ 9.339	11　58　20.6	+ 50.73	15　55.51		65.29	1　22.06	0.516
Wed.	23	2　00　48.08	9.358	12　18　32.3	50.23	15　55.25		65.35	1　34.21	0.497
Thur.	24	2　04　32.91	9.378	12　38　32.0	49.72	15　55.00		65.42	1　45.92	0.478
Frid.	25	2　08　18.20	+ 9.398	12　58　19.1	+ 49.21	15　54.75		65.49	1　57.14	0.458
Sat.	26	2　12　03.97	9.418	13　17　53.6	48.67	15　54.50		65.56	2　07.89	0.438
SUN.	27	2　15　50.25	9.439	13　37　15.1	48.12	15　54.25		65.63	2　18.14	0.417
Mon.	28	2　19　37.03	+ 9.460	13　56　23.1	+ 47.56	15　54.01		65.70	2　27.88	0.395
Tues.	29	2　23　24.34	9.482	14　15　17.6	46.98	15　53.76		65.77	2　37.10	0.373
Wed.	30	2　27　12.19	9.505	14　33　57.9	46.39	15　53.52		65.85	2　45.78	0 350
Thur.	31	2　31　00.58	+ 9.528	N. 14　52　24.0	+ 45.78	15　53.28		65.92	2　53.92	0.328

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting 0.18ˢ from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.								
Day of the Week	Day of the Month	THE SUN'S				Equation of Time, to be Subtracted from Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	0 39 48.58	+ 9.100	N. 4 17 15.2	+ 57.99	4 10.18	+ 0.757	0 35 38.40
Wed.	2	0 43 27.03	9.105	4 40 24.7	57.79	3 52.08	0.752	0 39 34.95
Thur.	3	0 47 05.60	9.110	5 03 29.2	57.58	3 34.10	0.746	0 43 31.50
Frid.	4	0 50 44.33	+ 9.117	5 26 28.4	+ 57.35	3 16.28	+ 0.739	0 47 28.05
Sat.	5	0 54 23.23	9.124	5 49 21.9	57.11	2 58.63	0.732	0 51 24.60
SUN.	6	0 58 02.30	9.132	6 12 09.4	56.85	2 41.15	0.724	0 55 21.16
Mon.	7	1 01 41.58	+ 9.141	6 34 50.5	+ 56.57	2 23.87	+ 0.715	0 59 17.71
Tues.	8	1 05 21.07	9.150	6 57 24.9	56.28	2 06.81	0.706	1 03 14.26
Wed.	9	1 09 00.79	9.160	7 19 52.2	55.98	1 49.98	0.696	1 07 10.81
Thur.	10	1 12 40.74	+ 9.170	7 42 12.0	+ 55.66	1 33.38	+ 0.686	1 11 07.36
Frid.	11	1 16 20.95	9.181	8 04 24.0	55.33	1 17.03	0.675	1 15 03.92
Sat.	12	1 20 01.42	9.192	8 26 27.8	54.98	1 00.95	0.664	1 19 00.47
SUN.	13	1 23 42.17	+ 9.204	8 48 23.1	+ 54.62	0 45.15	+ 0.652	1 22 57.02
Mon.	14	1 27 23.20	9.216	9 10 09.5	54.24	0 29.63	0.640	1 26 53.58
Tues.	15	1 31 04.55	9.229	9 31 46.8	53.85	0 14.42	0.627	1 30 50.13
Wed.	16	1 34 46.22	+ 9.243	9 53 14.4	+ 53.45	0 00.46	+ 0.613	1 34 46.68
Thur.	17	1 38 28.23	9.258	10 14 32.1	53.03	0 15.01	0.599	1 38 43.24
Frid.	18	1 42 10.59	9.273	10 35 39.7	52.60	0 29.20	0.584	1 42 39.79
Sat.	19	1 45 53.32	+ 9.289	10 56 36.8	+ 52.15	0 43.02	+ 0.568	1 46 36.34
SUN.	20	1 49 36.45	9.306	11 17 23.0	51.69	0 56.44	0.551	1 50 32.89
Mon.	21	1 53 19.98	9.323	11 37 58.1	51.22	1 09.47	0.534	1 54 29.45
Tues.	22	1 57 03.93	+ 9.341	11 58 21.8	+ 50.74	1 22.07	+ 0.516	1 58 26.00
Wed.	23	2 00 48.33	9.359	12 18 33.6	50.24	1 34.22	0.497	2 02 22.55
Thur.	24	2 04 33.18	9.378	12 38 33.4	49.73	1 45.93	0.478	2 06 19.11
Frid.	25	2 08 18.50	+ 9.398	12 58 20.7	+ 49.21	1 57.16	+ 0.458	2 10 15.66
Sat.	26	2 12 04.30	9.419	13 17 55.3	48.67	2 07.91	0.438	2 14 12.21
SUN.	27	2 15 50.61	9.440	13 37 16.9	48.12	2 18.16	0.417	2 18 08.77
Mon.	28	2 19 37.42	+ 9.461	13 56 25.0	+ 47.56	2 27.90	+ 0.395	2 22 05.32
Tues.	29	2 23 24.76	9.483	14 15 19.6	46.98	2 37.12	0.373	2 26 01.88
Wed.	30	2 27 12.63	9.506	14 34 00.0	46.39	2 45.80	0.350	2 29 58.43
Thur.	31	2 31 01.04	+ 9.529	N.14 52 26.2	+ 45.78	2 53.94	+ 0.328	2 33 54.98

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff for 1 Hour
+ 9.8565ˢ.
(Table III.)

		AT GREENWICH MEAN NOON.							
		THE SUN'S					Logarithm of the Radius Vector of the Earth.		Mean Time of Sidereal Noon
Day of the Month.	Day of the Year.	TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			Diff. for 1 Hour.	
		λ	λ'						
		° ′ ″	′ ″	″	″				h m s
1	91	10 50 01.7	49 39.4	147.94	+ 0.48		9.999 8248	+ 53.3	23 20 31.53
2	92	11 49 11.6	48 49.2	147.87	0.50		9.999 9528	53.3	23 16 35.63
3	93	12 48 19.7	47 57.2	147.80	0.51		0.000 0806	53.2	23 12 39.72
4	94	13 47 26.0	47 03.4	147.73	+ 0.50		0.000 2079	+ 53.0	23 08 43.82
5	95	14 46 30.5	46 07.8	147.65	0.43		0.000 3348	52.7	23 04 47.91
6	96	15 45 33.2	45 10.4	147.57	0.32		0.000 4611	52.4	23 00 52.00
7	97	16 44 34.0	44 11.1	147.49	+ 0.21		0.000 5866	+ 52.1	22 56 56.10
8	98	17 43 32.8	43 09.9	147.41	+ 0.08		0.000 7111	51.7	22 53 00.19
9	99	18 42 29.6	42 06.6	147.33	− 0.06		0.000 8348	51.3	22 49 04.28
10	100	19 41 24.4	41 01.2	147.24	− 0.20		0.000 9574	+ 50.9	22 45 08.38
11	101	20 40 16.9	39 53.7	147.15	0.33		0.001 0791	50.5	22 41 12.47
12	102	21 39 07.3	38 43.9	147.05	0.44		0.001 2000	50.2	22 37 16.56
13	103	22 37 55.4	37 32.0	146.96	− 0.54		0.001 3200	+ 49.9	22 33 20.66
14	104	23 36 41.2	36 17.7	146.86	0.60		0.001 4393	49.6	22 29 24.75
15	105	24 35 24.7	35 01.1	146.77	0.65		0.001 5580	49.4	22 25 28.84
16	106	25 34 06.0	33 42.3	146.67	− 0.65		0.001 6762	+ 49.2	22 21 32.94
17	107	26 32 45.0	32 21.2	146.58	0.63		0.001 7940	49.0	22 17 37.03
18	108	27 31 21.8	30 57.9	146.49	0.57		0.001 9115	48.9	22 13 41.12
19	109	28 29 56.5	29 32.5	146.40	− 0.48		0.002 0288	+ 48.8	22 09 45.21
20	110	29 28 29.1	28 05.0	146.31	0.37		0.002 1458	48.7	22 05 49.31
21	111	30 26 59.6	26 35.4	146.23	0.24		0.002 2627	48.7	22 01 53.40
22	112	31 25 28.2	25 03.9	146.15	− 0.12		0.002 3794	+ 48.6	21 57 57.49
23	113	32 23 54.8	23 30.4	146.07	+ 0.03		0.002 4959	48.5	21 54 01.58
24	114	33 22 19.7	21 55.2	145.99	0.14		0.002 6122	48.4	21 50 05.68
25	115	34 20 42.8	20 18.1	145.92	+ 0.26		0.002 7280	+ 48.2	21 46 09.77
26	116	35 19 04.1	18 39.4	145.85	0.37		0.002 8435	48.0	21 42 13.86
27	117	36 17 23.8	16 58.9	145.78	0.46		0.002 9586	47.8	21 38 17.96
28	118	37 15 41.8	15 16.9	145.72	+ 0.52		0.003 0730	+ 47.5	21 34 22.05
29	119	38 13 58.4	13 33.3	145.65	0.58		0.003 1867	47.2	21 30 26.14
30	120	39 12 13.3	11 48.2	145.59	0.58		0.003 2996	46.8	21 26 30.23
31	121	40 10 26.8	10 01.5	145.53	+ 0.55		0.003 4115	+ 46.4	21 22 34.32

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' to the mean equinox of January 0.0ᵈ of the Besselian fictitious year.

Diff. for 1 Hour,
− 9.8296ˢ.
(Table II.)

	GREENWICH MEAN TIME.								
	THE MOON'S								
Day of the Month.	**SEMIDIAMETER.**		**HORIZONTAL PARALLAX.**				**UPPER TRANSIT.**		**AGE.**
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 57.9	15 02.1	54 49.6	+ 1.18	55 05.0	+ 1.38	18 57.3	+ 2.00	22.4
2	15 06.9	15 12.4	55 22.7	1.57	55 42.6	1.75	19 45.3	2.00	23.4
3	15 18.3	15 24.7	56 04.5	1.89	56 27.9	2.01	20 33.4	2.01	24.4
4	15 31.5	15 38.5	56 52.7	+ 2.10	57 18.4	+ 2.16	21 22.0	+ 2.04	25.4
5	15 45.6	15 52.7	57 44.6	2.17	58 10.6	2.14	22 11.5	2.09	26.4
6	15 59.6	16 06.2	58 35.9	2.05	59 00.0	1.93	23 02.5	2.17	27.4
7	16 12.2	16 17.6	59 22.1	+ 1.75	59 41.9	+ 1.52	23 55.6	+ 2.26	28.4
8	16 22.2	16 25.9	59 58.8	1.26	60 12.3	0.98	☾		29.4
9	16 28.6	16 30.2	60 22.2	0.67	60 28.3	+ 0.35	0 51.1	2.36	0.9
10	16 30.8	16 30.4	60 30.6	+ 0.03	60 29.1	− 0.28	1 48.9	+ 2.45	1.9
11	16 29.0	16 26.8	60 24.0	− 0.56	60 15.6	0.82	2 48.6	2.50	2.9
12	16 23.7	16 20.0	60 04.4	1.03	59 50.8	1.21	3 48.8	2.50	3.9
13	16 15.8	16 11.1	59 35.2	− 1.36	59 18.1	− 1.47	4 48.2	+ 2.44	4.9
14	16 06.2	16 01.0	59 00.0	1.54	58 41.2	1.58	5 45.5	2.33	5.9
15	15 55.8	15 50.6	58 22.0	1.60	58 02.8	1.59	6 39.9	2.21	6.9
16	15 45.4	15 40.4	57 43.9	− 1.56	57 25.3	− 1.52	7 31.4	+ 2.09	7.9
17	15 35.5	15 30.7	57 07.3	1.48	56 49.8	1.42	8 20.2	1.99	8.9
18	15 26.1	15 21.8	56 33.1	1.36	56 17.1	1.30	9 07.1	1.92	9.9
19	15 17.6	15 13.6	56 01.8	− 1.25	55 47.1	− 1.18	9 52.7	+ 1.89	10.9
20	15 09.9	15 06.3	55 33.5	1.11	55 20.4	1.06	10 37.7	1.87	11.9
21	15 03.0	14 59.9	55 08.2	0.99	54 56.7	0.92	11 22.6	1.88	12.9
22	14 57.0	14 54.3	54 46.1	− 0.85	54 36.4	− 0.76	12 08.0	+ 1.90	13.9
23	14 51.9	14 49.9	54 27.7	0.68	54 20.2	0.58	12 54.0	1.93	14.9
24	14 48.2	14 46.8	54 13.8	0.47	54 08.9	0.36	13 40.8	1.96	15.9
25	14 45.9	14 45.3	54 05.3	− 0.23	54 03.4	− 0.09	14 28.1	+ 1.98	16.9
26	14 45.3	14 45.7	54 03.2	+ 0.06	54 04.8	+ 0.23	15 15.8	1.99	17.9
27	14 46.8	14 48.3	54 08.5	0.40	54 14.3	0.58	16 03.4	1.98	18.9
28	14 50.5	14 53.3	54 22.4	+ 0.77	54 32.7	+ 0.96	16 50.9	+ 1.97	19.9
29	14 56.8	15 00.9	54 45.4	1.16	55 00.5	1.35	17 38.0	1.96	20.9
30	15 05.7	15 11.0	55 18.0	1.55	55 37.7	1.73	18 24.9	1.96	21.9
31	15 17.0	15 23.5	55 59.6	+ 1.91	56 23.5	+ 2.06	19 11.9	+ 1.97	22.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 56 15.72	+ 2.0997	S.17 53 42.0	+ 3.928
1	18 58 21.70	2.0997	17 49 43.7	4.015
2	19 00 27.68	2.0997	17 45 40.2	4.102
3	19 02 33.66	2.0997	17 41 31.4	4.189
4	19 04 39.64	2.0996	17 37 17.5	4.275
5	19 06 45.61	2.0995	17 32 58.4	4.362
6	19 08 51.58	2.0995	17 28 34.1	4.448
7	19 10 57.55	2.0994	17 24 04.6	4.534
8	19 13 03.51	2.0993	17 19 30.0	4.620
9	19 15 09.47	2.0993	17 14 50.2	4.706
10	19 17 15.43	2.0993	17 10 05.3	4.791
11	19 19 21.39	2.0992	17 05 15.3	4.876
12	19 21 27.34	2.0992	17 00 20.2	4.961
13	19 23 33.29	2.0992	16 55 20.0	5.046
14	19 25 39.24	2.0991	16 50 14.7	5.131
15	19 27 45.18	2.0990	16 45 04.3	5.215
16	19 29 51.12	2.0990	16 39 48.9	5.298
17	19 31 57.06	2.0990	16 34 28.5	5.382
18	19 34 03.00	2.0990	16 29 03.0	5.467
19	19 36 08.94	2.0989	16 23 32.5	5.549
20	19 38 14.87	2.0988	16 17 57.1	5.632
21	19 40 20.80	2.0988	16 12 16.6	5.716
22	19 42 26.73	2.0987	16 06 31.2	5.798
23	19 44 32.65	+ 2.0987	S.16 00 40.8	+ 5.881

WEDNESDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 46 38.58	+ 2.0988	S.15 54 45.5	+ 5.962
1	19 48 44.51	2.0987	15 48 45.3	6.044
2	19 50 50.43	2.0987	15 42 40.2	6.126
3	19 52 56.36	2.0988	15 36 30.2	6.207
4	19 55 02.29	2.0988	15 30 15.4	6.287
5	19 57 08.22	2.0988	15 23 55.7	6.368
6	19 59 14.15	2.0988	15 17 31.2	6.448
7	20 1 20.08	2.0988	15 11 01.9	6.527
8	20 3 26.01	2.0989	15 04 27.9	6.607
9	20 5 31.95	2.0990	14 57 49.1	6.687
10	20 7 37.89	2.0990	14 51 05.5	6.766
11	20 9 43.83	2.0991	14 44 17.2	6.844
12	20 11 49.78	2.0992	14 37 24.2	6.922
13	20 13 55.74	2.0993	14 30 26.5	7.000
14	20 16 01.70	2.0994	14 23 24.2	7.077
15	20 18 07.67	2.0996	14 16 17.2	7.154
16	20 20 13.65	2.0997	14 09 05.7	7.231
17	20 22 19.63	2.0998	14 01 49.5	7.307
18	20 24 25.63	2.1000	13 54 28.8	7.383
19	20 26 31.63	2.1002	13 47 03.5	7.459
20	20 28 37.65	2.1004	13 39 33.7	7.534
21	20 30 43.68	2.1006	13 31 59.4	7.609
22	20 32 49.72	2.1008	13 24 20.6	7.683
23	20 34 55.78	2.1012	13 16 37.4	7.757
24	20 37 01.86	+ 2.1014	S.13 08 49.8	+ 7.830

THURSDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 37 01.86	+ 2.1014	S.13 08 49.8	+ 7.830
1	20 39 07.95	2.1016	13 00 57.8	7.903
2	20 41 14.05	2.1019	12 53 01.4	7.976
3	20 43 20.18	2.1022	12 45 00.7	8.048
4	20 45 26.32	2.1025	12 36 55.6	8.120
5	20 47 32.48	2.1028	12 28 46.3	8.191
6	20 49 38.66	2.1032	12 20 32.7	8.262
7	20 51 44.87	2.1037	12 12 14.8	8.332
8	20 53 51.10	2.1041	12 03 52.8	8.402
9	20 55 57.36	2.1045	11 55 26.6	8.472
10	20 58 03.64	2.1049	11 46 56.2	8.541
11	21 00 09.95	2.1054	11 38 21.7	8.609
12	21 02 16.29	2.1059	11 29 43.1	8.677
13	21 04 22.66	2.1064	11 21 00.5	8.744
14	21 06 29.06	2.1069	11 12 13.8	8.811
15	21 08 35.49	2.1075	11 03 23.2	8.877
16	21 10 41.96	2.1082	10 54 28.6	8.942
17	21 12 48.47	2.1087	10 45 30.1	9.007
18	21 14 55.01	2.1093	10 36 27.7	9.072
19	21 17 01.59	2.1100	10 27 21.4	9.137
20	21 19 08.21	2.1107	10 18 11.3	9.200
21	21 21 14.88	2.1115	10 08 57.4	9.263
22	21 23 21.59	2.1122	9 59 39.7	9.325
23	21 25 28.34	+ 2.1128	S. 9 50 18.4	+ 9.387

FRIDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 27 35.13	+ 2.1137	S. 9 40 53.3	+ 9.448
1	21 29 41.98	2.1145	9 31 24.6	9.508
2	21 31 48.87	2.1153	9 21 52.3	9.568
3	21 33 55.82	2.1162	9 12 16.4	9.627
4	21 36 02.82	2.1171	9 02 37.0	9.686
5	21 38 09.87	2.1180	8 52 54.1	9.744
6	21 40 16.98	2.1190	8 43 07.7	9.802
7	21 42 24.15	2.1200	8 33 17.9	9.858
8	21 44 31.38	2.1210	8 23 24.7	9.914
9	21 46 38.67	2.1220	8 13 28.2	9.969
10	21 48 46.02	2.1231	8 03 28.4	10.024
11	21 50 53.44	2.1242	7 53 25.3	10.078
12	21 53 00.93	2.1254	7 43 19.0	10.131
13	21 55 08.49	2.1265	7 33 09.6	10.183
14	21 57 16.11	2.1277	7 22 57.0	10.235
15	21 59 23.81	2.1289	7 12 41.4	10.286
16	22 01 31.58	2.1302	7 02 22.7	10.337
17	22 03 39.43	2.1315	6 52 01.0	10.386
18	22 05 47.36	2.1328	6 41 36.4	10.434
19	22 07 55.37	2.1342	6 31 08.9	10.482
20	22 10 03.46	2.1356	6 20 38.5	10.530
21	22 12 11.64	2.1371	6 10 05.3	10.577
22	22 14 19.91	2.1385	5 59 29.3	10.622
23	22 16 28.26	2.1399	5 48 50.6	10.667
24	22 18 36.70	+ 2.1415	S. 5 38 09.3	+ 10.710

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 5.					**MONDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 18 36.70	+ 2.1415	S. 5 38 09.3	+ 10.710	0	0 03 50.63	+ 2.2569	N. 3 28 25.8	+ 11.647
1	22 20 45.23	2.1430	5 27 25.4	10.753	1	0 06 06.14	2.2602	3 40 04.4	11.639
2	22 22 53.86	2.1447	5 16 38.9	10.796	2	0 08 21.85	2.2635	3 51 42.5	11.629
3	22 25 02.59	2.1463	5 05 49.9	10.837	3	0 10 37.76	2.2668	4 03 19.9	11.617
4	22 27 11.42	2.1480	4 54 58.4	10.878	4	0 12 53.87	2.2702	4 14 56.5	11.603
5	22 29 20.35	2.1497	4 44 04.5	10.917	5	0 15 10.18	2.2736	4 26 32.3	11.589
6	22 31 29.38	2.1513	4 33 08.3	10.956	6	0 17 26.70	2.2770	4 38 07.2	11.574
7	22 33 38.51	2.1532	4 22 09.8	10.994	7	0 19 43.42	2.2803	4 49 41.2	11.557
8	22 35 47.76	2.1550	4 11 09.0	11.031	8	0 22 00.34	2.2837	5 01 14.1	11.538
9	22 37 57.11	2.1568	4 00 06.1	11.067	9	0 24 17.47	2.2873	5 12 45.8	11.518
10	22 40 06.58	2.1587	3 49 01.0	11.102	10	0 26 34.81	2.2908	5 24 16.2	11.497
11	22 42 16.16	2.1606	3 37 53.8	11.137	11	0 28 52.36	2.2942	5 35 45.4	11.474
12	22 44 25.85	2.1625	3 26 44.6	11.169	12	0 31 10.12	2.2978	5 47 13.1	11.450
13	22 46 35.66	2.1646	3 15 33.5	11.202	13	0 33 28.10	2.3014	5 58 39.4	11.425
14	22 48 45.60	2.1666	3 04 20.4	11.233	14	0 35 46.29	2.3050	6 10 04.1	11.397
15	22 50 55.65	2.1686	2 53 05.5	11.263	15	0 38 04.70	2.3087	6 21 27.1	11.369
16	22 53 05.83	2.1707	2 41 48.8	11.293	16	0 40 23.33	2.3123	6 32 48.4	11.340
17	22 55 16.14	2.1729	2 30 30.3	11.322	17	0 42 42.18	2.3159	6 44 07.9	11.308
18	22 57 26.58	2.1751	2 19 10.2	11.348	18	0 45 01.24	2.3196	6 55 25.4	11.275
19	22 59 37.15	2.1772	2 07 48.5	11.375	19	0 47 20.53	2.3233	7 06 40.9	11.242
20	23 01 47.85	2.1795	1 56 25.2	11.401	20	0 49 40.04	2.3271	7 17 54.4	11.207
21	23 03 58.69	2.1818	1 45 00.4	11.425	21	0 51 59.78	2.3308	7 29 05.7	11.169
22	23 06 09.67	2.1842	1 33 34.2	11.447	22	0 54 19.74	2.3345	7 40 14.7	11.131
23	23 08 20.79	+ 2.1865	S. 1 22 06.7	+ 11.470	23	0 56 39.92	+ 2.3382	N. 7 51 21.4	+ 11.091
	SUNDAY 6.					**TUESDAY 8.**			
0	23 10 32.05	+ 2.1889	S. 1 10 37.8	+ 11.492	0	0 59 00.33	+ 2.3421	N. 8 02 25.6	+ 11.049
1	23 12 43.46	2.1913	0 59 07.7	11.511	1	1 01 20.97	2.3459	8 13 27.3	11.007
2	23 14 55.01	2.1937	0 47 36.5	11.529	2	1 03 41.84	2.3497	8 24 26.4	10.962
3	23 17 06.71	2.1962	0 36 04.2	11.547	3	1 06 02.94	2.3535	8 35 22.8	10.917
4	23 19 18.56	2.1987	0 24 30.8	11.564	4	1 08 24.26	2.3573	8 46 16.4	10.870
5	23 21 30.56	2.2013	0 12 56.5	11.580	5	1 10 45.82	2.3612	8 57 07.2	10.822
6	23 23 42.72	2.2040	S. 0 01 21.2	11.595	6	1 13 07.61	2.3651	9 07 55.0	10.771
7	23 25 55.04	2.2067	N. 0 10 14.9	11.607	7	1 15 29.63	2.3689	9 18 39.7	10.719
8	23 28 07.52	2.2093	0 21 51.7	11.619	8	1 17 51.88	2.3727	9 29 21.3	10.667
9	23 30 20.16	2.2121	0 33 29.2	11.630	9	1 20 14.36	2.3766	9 39 59.7	10.612
10	23 32 32.97	2.2148	0 45 07.3	11.640	10	1 22 37.07	2.3805	9 50 34.8	10.557
11	23 34 45.94	2.2175	0 56 46.0	11.649	11	1 25 00.02	2.3844	10 01 06.5	10.499
12	23 36 59.07	2.2203	1 08 25.2	11.657	12	1 27 23.20	2.3882	10 11 34.7	10.440
13	23 39 12.38	2.2232	1 20 04.8	11.662	13	1 29 46.61	2.3922	10 21 59.3	10.379
14	23 41 25.86	2.2262	1 31 44.7	11.667	14	1 32 10.26	2.3960	10 32 20.2	10.317
15	23 43 39.52	2.2291	1 43 24.9	11.671	15	1 34 34.13	2.3998	10 42 37.4	10.255
16	23 45 53.35	2.2321	1 55 05.2	11.673	16	1 36 58.24	2.4037	10 52 50.8	10.190
17	23 48 07.37	2.2351	2 06 45.7	11.675	17	1 39 22.58	2.4076	11 03 00.2	10.124
18	23 50 21.56	2.2381	2 18 26.2	11.675	18	1 41 47.15	2.4115	11 13 05.6	10.057
19	23 52 35.94	2.2412	2 30 06.7	11.673	19	1 44 11.96	2.4153	11 23 07.0	9.987
20	23 54 50.50	2.2442	2 41 47.0	11.671	20	1 46 36.99	2.4191	11 33 04.1	9.916
21	23 57 05.25	2.2474	2 53 27.2	11.667	21	1 49 02.25	2.4230	11 42 56.9	9.844
22	23 59 20.19	2.2505	3 05 07.1	11.662	22	1 51 27.75	2.4268	11 52 45.4	9.771
23	0 01 35.31	2.2537	3 16 46.7	11.656	23	1 53 53.47	2.4305	12 02 29.4	9.696
24	0 03 50.63	+ 2.2569	N. 3 28 25.8	+ 11.647	24	1 56 19.41	+ 2.4342	N.12 12 08.9	+ 9.620

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 9.					**FRIDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 56 19.41	+ 2.4342	N. 12 12 08.9	+ 9.620	0	3 56 51.85	+ 2.5675	N. 18 01 35.0	+ 4.519
1	1 58 45.58	2.4381	12 21 43.8	9.542	1	3 59 25.94	2.5687	18 06 02.3	4.391
2	2 01 11.98	2.4418	12 31 13.9	9.462	2	4 02 00.10	2.5698	18 10 21.9	4.261
3	2 03 38.60	2.4455	12 40 39.3	9.382	3	4 04 34.32	2.5708	18 14 33.6	4.130
4	2 06 05.44	2.4492	12 49 59.8	9.301	4	4 07 08.60	2.5717	18 18 37.5	4.000
5	2 08 32.51	2.4529	12 59 15.4	9.217	5	4 09 42.93	2.5726	18 22 33.6	3.869
6	2 10 59.79	2.4565	13 08 25.9	9.132	6	4 12 17.31	2.5733	18 26 21.8	3.737
7	2 13 27.29	2.4602	13 17 31.2	9.046	7	4 14 51.73	2.5739	18 30 02.0	3.605
8	2 15 55.01	2.4638	13 26 31.4	8.959	8	4 17 26.18	2.5745	18 33 34.4	3.473
9	2 18 22.95	2.4674	13 35 26.3	8.870	9	4 20 00.67	2.5750	18 36 58.8	3.340
10	2 20 51.10	2.4709	13 44 15.8	8.780	10	4 22 35.18	2.5754	18 40 15.2	3.207
11	2 23 19.46	2.4744	13 52 59.9	8.689	11	4 25 09.72	2.5757	18 43 23.6	3.073
12	2 25 48.03	2.4779	14 01 38.5	8.596	12	4 27 44.27	2.5759	18 46 24.0	2.940
13	2 28 16.81	2.4813	14 10 11.4	8.502	13	4 30 18.83	2.5760	18 49 16.4	2.805
14	2 30 45.79	2.4847	14 18 38.7	8.407	14	4 32 53.39	2.5759	18 52 00.7	2.671
15	2 33 14.98	2.4882	14 27 00.2	8.310	15	4 35 27.94	2.5758	18 54 36.9	2.537
16	2 35 44.37	2.4915	14 35 15.9	8.212	16	4 38 02.49	2.5757	18 57 05.1	2.402
17	2 38 13.96	2.4948	14 43 25.7	8.113	17	4 40 37.02	2.5753	18 59 25.2	2.267
18	2 40 43.75	2.4980	14 51 29.5	8.012	18	4 43 11.53	2.5750	19 01 37.1	2.132
19	2 43 13.72	2.5012	14 59 27.2	7.911	19	4 45 46.02	2.5746	19 03 41.0	1.597
20	2 45 43.89	2.5043	15 07 18.8	7.808	20	4 48 20.48	2.5740	19 05 36.8	1.862
21	2 48 14.24	2.5074	15 15 04.2	7.705	21	4 50 54.90	2.5733	19 07 24.4	1.726
22	2 50 44.78	2.5105	15 22 43.4	7.600	22	4 53 29.28	2.5727	19 09 03.9	1.591
23	2 53 15.50	+ 2.5135	N. 15 30 16.2	+ 7.493	23	4 56 03.62	+ 2.5718	N. 19 10 35.3	+ 1.456
	THURSDAY 10.					**SATURDAY 12.**			
0	2 55 46.40	+ 2.5164	N. 15 37 42.6	+ 7.386	0	4 58 37.90	+ 2.5708	N. 19 11 58.6	+ 1.321
1	2 58 17.47	2.5193	15 45 02.5	7.277	1	5 01 12.12	2.5698	19 13 13.8	1.186
2	3 00 48.72	2.5222	15 52 15.9	7.168	2	5 03 46.28	2.5687	19 14 20.9	1.050
3	3 03 20.14	2.5250	15 59 22.7	7.057	3	5 06 20.37	2.5675	19 15 19.8	0.914
4	3 05 51.72	2.5277	16 06 22.8	6.946	4	5 08 54.38	2.5662	19 16 10.6	0.780
5	3 08 23.47	2.5304	16 13 16.2	6.832	5	5 11 28.31	2.5648	19 16 53.4	0.646
6	3 10 55.37	2.5329	16 20 02.7	6.718	6	5 14 02.16	2.5634	19 17 28.1	0.511
7	3 13 27.42	2.5355	16 26 42.4	6.604	7	5 16 35.92	2.5618	19 17 54.7	0.377
8	3 15 59.63	2.5380	16 33 15.2	6.488	8	5 19 09.58	2.5602	19 18 13.3	0.242
9	3 18 31.98	2.5403	16 39 41.0	6.372	9	5 21 43.14	2.5584	19 18 23.8	+ 0.108
10	3 21 04.47	2.5427	16 45 59.8	6.254	10	5 24 16.59	2.5566	19 18 26.3	− 0.025
11	3 23 37.11	2.5450	16 52 11.5	6.135	11	5 26 49.93	2.5547	19 18 20.8	0.159
12	3 26 09.87	2.5471	16 58 16.0	6.015	12	5 29 23.16	2.5527	19 18 07.2	0.292
13	3 28 42.76	2.5492	17 04 13.3	5.895	13	5 31 56.26	2.5506	19 17 45.7	0.425
14	3 31 15.78	2.5513	17 10 03.4	5.774	14	5 34 29.23	2.5484	19 17 16.2	0.557
15	3 33 48.92	2.5533	17 15 46.2	5.652	15	5 37 02.07	2.5462	19 16 38.8	0.689
16	3 36 22.18	2.5552	17 21 21.6	5.529	16	5 39 34.77	2.5438	19 15 53.5	0.821
17	3 38 55.55	2.5570	17 26 49.7	5.405	17	5 42 07.33	2.5414	19 15 00.3	0.952
18	3 41 29.02	2.5587	17 32 10.3	5.281	18	5 44 39.74	2.5388	19 13 59.3	1.082
19	3 44 02.60	2.5604	17 37 23.4	5.155	19	5 47 11.99	2.5362	19 12 50.5	1.212
20	3 46 36.27	2.5620	17 42 28.9	5.029	20	5 49 44.09	2.5336	19 11 33.8	1.342
21	3 49 10.04	2.5636	17 47 26.9	4.903	21	5 52 16.02	2.5308	19 10 09.4	1.471
22	3 51 43.90	2.5650	17 52 17.3	4.776	22	5 54 47.79	2.5281	19 08 37.3	1.600
23	3 54 17.84	2.5662	17 57 00.0	4.647	23	5 57 19.39	2.5252	19 06 57.4	1.728
24	3 56 51.85	+ 2.5675	N. 18 01 35.0	+ 4.519	24	5 59 50.81	+ 2.5222	N. 19 05 09.9	− 1.856

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 13.					TUESDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 59 50.81	+ 2.5222	N.19 05 09.9	− 1.856	0	7 56 27.05	+ 2.3227	N.15 23 55.8	− 7.012
1	6 02 22.05	2.5192	19 03 14.7	1.982	1	7 58 46.27	2.3179	15 16 52.6	7.095
2	6 04 53.11	2.5160	19 01 12.0	2.108	2	8 01 05.20	2.3132	15 09 44.4	7.177
3	6 07 23.97	2.5128	18 59 01.7	2.234	3	8 03 23.85	2.3085	15 02 31.3	7.258
4	6 09 54.65	2.5097	18 56 43.9	2.359	4	8 05 42.22	2.3038	14 55 13.4	7.339
5	6 12 25.13	2.5063	18 54 18.6	2.483	5	8 08 00.31	2.2992	14 47 50.6	7.419
6	6 14 55.41	2.5029	18 51 45.9	2.607	6	8 10 18.12	2.2945	14 40 23.1	7.497
7	6 17 25.48	2.4994	18 49 05.7	2.731	7	8 12 35.65	2.2898	14 32 51.0	7.574
8	6 19 55.34	2.4959	18 46 18.2	2.852	8	8 14 52.90	2.2852	14 25 14.2	7.651
9	6 22 24.99	2.4924	18 43 23.4	2.973	9	8 17 09.87	2.2805	14 17 32.9	7.726
10	6 24 54.43	2.4888	18 40 21.4	3.094	10	8 19 26.56	2.2758	14 09 47.1	7.800
11	6 27 23.65	2.4851	18 37 12.1	3.214	11	8 21 42.97	2.2712	14 01 56.9	7.872
12	6 29 52 64	2.4813	18 33 55.7	3.332	12	8 23 59.10	2.2666	13 54 02.4	7.944
13	6 32 21.41	2.4776	18 30 32.2	3.451	13	8 26 14.96	2.2620	13 46 03.6	8.015
14	6 34 49.95	2.4737	18 27 01 6	3.569	14	8 28 30.54	2.2574	13 38 00.6	8.084
15	6 37 18.26	2.4698	18 23 23.9	3.686	15	8 30 45.85	2.2529	13 29 53.5	8.153
16	6 39 46.33	2.4658	18 19 39.3	3.802	16	8 33 00.89	2.2483	13 21 42.2	8.222
17	6 42 14.16	2.4618	18 15 47.7	3.917	17	8 35 15.65	2.2437	13 13 26.9	8.288
18	6 44 41.75	2.4578	18 11 49.2	4.031	18	8 37 30.14	2.2392	13 05 07.7	8.353
19	6 47 09.10	2.4537	18 07 44.0	4.144	19	8 39 44.36	2.2348	12 56 44.5	8.418
20	6 49 36.20	2.4496	18 03 31.9	4.257	20	8 41 58.32	2.2304	12 48 17.5	8.482
21	6 52 03.05	2.4454	17 59 13.2	4.368	21	8 44 12.01	2.2259	12 39 46.7	8.544
22	6 54 29.65	2.4412	17 54 47.7	4.480	22	8 46 25.43	2.2215	12 31 12.2	8.605
23	6 56 56 00	+ 2.4369	N.17 50 15.6	− 4.589	23	8 48 38.59	+ 2.2171	N.12 22 34.1	− 8.666
	MONDAY 14.					WEDNESDAY 16.			
0	6 59 22.08	+ 2.4326	N.17 45 37.0	− 4.697	0	8 50 51.48	+ 2.2127	N.12 13 52.3	− 8.725
1	7 01 47.91	2.4283	17 40 51.9	4.806	1	8 53 04.12	2.2084	12 05 07.1	8.782
2	7 04 13.48	2.4240	17 36 00.3	4.912	2	8 55 16.49	2.2041	11 56 18.4	8.840
3	7 06 38.79	2.4196	17 31 02.4	5.018	3	8 57 28.61	2.1999	11 47 26.3	8.897
4	7 09 03.83	2.4151	17 25 58.1	5.123	4	8 59 40.48	2.1957	11 38 30.8	8.952
5	7 11 28.60	2.4107	17 20 47.6	5.227	5	9 01 52.09	2.1914	11 29 32.1	9.006
6	7 13 53.11	2.4062	17 15 30.8	5.331	6	9 04 03.45	2.1872	11 20 30.1	9.059
7	7 16 17.35	2.4017	17 10 07.9	5.432	7	9 06 14.56	2.1831	11 11 25.0	9.111
8	7 18 41.32	2.3972	17 04 38.9	5.533	8	9 08 25.42	2.1790	11 02 16.8	9.162
9	7 21 05.01	2.3926	16 59 03.9	5.633	9	9 10 36.04	2.1749	10 53 05.5	9.213
10	7 23 28.43	2.3881	16 53 22.9	5.732	10	9 12 46.41	2.1708	10 43 51.2	9.262
11	7 25 51.58	2.3835	16 47 36.0	5.831	11	9 14 56.54	2.1668	10 34 34.0	9.310
12	7 28 14.45	2.3788	16 41 43.2	5.928	12	9 17 06.43	2.1628	10 25 14.0	9.357
13	7 30 37.04	2.3742	16 35 44.6	6.024	13	9 19 16.08	2.1589	10 15 51.2	9.403
14	7 32 59.36	2.3696	16 29 40.3	6.118	14	9 21 25.50	2.1550	10 06 25.6	9.449
15	7 35 21.39	2.3648	16 23 30.4	6.212	15	9 23 34.68	2.1511	9 56 57.3	9.493
16	7 37 43.14	2.3602	16 17 14.8	6.306	16	9 25 43.63	2.1472	9 47 26.4	9.536
17	7 40 04.62	2.3556	16 10 53.7	6.397	17	9 27 52.35	2.1435	9 37 53.0	9.577
18	7 42 25.81	2.3508	16 04 27.1	6.488	18	9 30 00.85	2.1397	9 28 17.1	9.619
19	7 44 46.72	2.3462	15 57 55.1	6.578	19	9 32 09.12	2.1361	9 18 38.7	9.660
20	7 47 07.35	2.3415	15 51 17.7	6.667	20	9 34 17.18	2.1324	9 08 57.9	9.699
21	7 49 27.70	2.3368	15 44 35.0	6.755	21	9 36 25.01	2.1287	8 59 14.8	9.737
22	7 51 47.77	2.3321	15 37 47.1	6.842	22	9 38 32.62	2.1251	8 49 29.4	9.775
23	7 54 07.55	2.3273	15 30 54.0	6.927	23	9 40 40.02	2.1215	8 39 41.8	9.812
24	7 56 27.05	+ 2.3227	N.15 23 55.8	− 7.012	24	9 42 47.20	+ 2.1180	N. 8 29 52.0	− 9.847

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
	THURSDAY 17.					**SATURDAY 19.**			
0	9 42 47.20	+2.1180	N. 8 29 52.0	−9.847	0	11 21 13.50	+2.0008	N. 0 13 23.9	−10.511
1	9 44 54.18	2.1146	8 20 00.1	9.882	1	11 23 13.51	1.9995	N. 0 02 53.4	10.505
2	9 47 00.95	2.1111	8 10 06.2	9.915	2	11 25 13.44	1.9982	S. 0 07 36.7	10.498
3	9 49 07.51	2.1077	8 00 10.3	9.948	3	11 27 13.29	1.9969	0 18 06.4	10.490
4	9 51 13.87	2.1043	7 50 12.4	9.980	4	11 29 13.07	1.9957	0 28 35.5	10.481
5	9 53 20.03	2.1010	7 40 12.7	10.010	5	11 31 12.77	1.9945	0 39 04.1	10.472
6	9 55 25.99	2.0977	7 30 11.2	10.040	6	11 33 12.41	1.9934	0 49 32.2	10.462
7	9 57 31.76	2.0946	7 20 07.9	10.069	7	11 35 11.98	1.9923	0 59 59.6	10.451
8	9 59 37.34	2.0914	7 10 02.9	10.097	8	11 37 11.49	1.9913	1 10 26.3	10.439
9	10 01 42.73	2.0882	6 59 56.2	10.125	9	11 39 10.94	1.9902	1 20 52.3	10.427
10	10 03 47.93	2.0851	6 49 47.9	10.150	10	11 41 10.32	1.9892	1 31 17.5	10.413
11	10 05 52.94	2.0820	6 39 38.2	10.175	11	11 43 09.65	1.9884	1 41 41.9	10.400
12	10 07 57.77	2.0791	6 29 26.9	10.200	12	11 45 08.93	1.9875	1 52 05.5	10.386
13	10 10 02.43	2.0762	6 19 14.2	10.223	13	11 47 08.15	1.9866	2 02 28.2	10.370
14	10 12 06.91	2.0732	6 09 00.1	10.247	14	11 49 07.32	1.9858	2 12 49.9	10.353
15	10 14 11.21	2.0702	5 58 44.6	10.268	15	11 51 06.45	1.9851	2 23 10.6	10.337
16	10 16 15.34	2.0674	5 48 27.9	10.289	16	11 53 05.53	1.9843	2 33 30.3	10.319
17	10 18 19.30	2.0647	5 38 09 9	10.309	17	11 55 04.57	1.9837	2 43 48.9	10.301
18	10 20 23.10	2.0620	5 27 50.8	10.327	18	11 57 03.57	1.9830	2 54 06.4	10.282
19	10 22 26.74	2.0593	5 17 30.6	10.346	19	11 59 02.53	1.9823	3 04 22.7	10.262
20	10 24 30.22	2.0567	5 07 09.3	10.364	20	12 01 01.45	1.9817	3 14 37.8	10.242
21	10 26 33.54	2.0540	4 56 46.9	10.381	21	12 03 00.34	1.9812	3 24 51.7	10.220
22	10 28 36.70	2.0514	4 46 23.6	10.396	22	12 04 59.20	1.9808	3 35 04.2	10.197
23	10 30 39.71	+2.0489	N. 4 35 59.4	−10.411	23	12 06 58.04	+1.9804	S. 3 45 15.4	−10.176
	FRIDAY 18.					**SUNDAY 20.**			
0	10 32 42.57	+2.0465	N. 4 25 34.3	−10.425	0	12 08 56.85	+1.9799	S. 3 55 25.3	−10.152
1	10 34 45.29	2.0441	4 15 08.4	10.438	1	12 10 55.63	1.9796	4 05 33.7	10.128
2	10 36 47.86	2.0417	4 04 41.7	10.450	2	12 12 54.40	1.9792	4 15 40.7	10.104
3	10 38 50.29	2.0393	3 54 14.4	10.461	3	12 14 53.14	1.9789	4 25 46.2	10.078
4	10 40 52.58	2.0370	3 43 46.4	10.472	4	12 16 51.87	1.9787	4 35 50.1	10.052
5	10 42 54.73	2.0347	3 33 17.7	10.482	5	12 18 50.58	1.9784	4 45 52.4	10.025
6	10 44 56.75	2.0326	3 22 48.5	10.491	6	12 20 49.28	1.9782	4 55 53.1	9.997
7	10 46 58.64	2.0305	3 12 18.8	10.499	7	12 22 47.96	1.9780	5 05 52.1	9.969
8	10 49 00.41	2.0284	3 01 48.6	10.507	8	12 24 46.64	1.9779	5 15 49.4	9.940
9	10 51 02.05	2.0263	2 51 18.0	10.512	9	12 26 45.31	1.9778	5 25 44.9	9.911
10	10 53 03.57	2.0243	2 40 47.1	10.517	10	12 28 43.98	1.9777	5 35 38.7	9.881
11	10 55 04.97	2.0223	2 30 15.9	10.522	11	12 30 42.64	1.9777	5 45 30.6	9.849
12	10 57 06.25	2.0204	2 19 44.4	10.527	12	12 32 41.31	1.9778	5 55 20.6	9.817
13	10 59 07.42	2.0185	2 09 12.7	10.529	13	12 34 39.98	1.9778	6 05 08.7	9.786
14	11 01 08.47	2.0167	1 58 40.9	10.532	14	12 36 38.65	1.9778	6 14 54.9	9.752
15	11 03 09.42	2.0149	1 48 08.9	10.533	15	12 38 37.32	1.9780	6 24 39.0	9.718
16	11 05 10.26	2.0132	1 37 36.9	10.534	16	12 40 36.01	1.9782	6 34 21.1	9.684
17	11 07 11.00	2.0114	1 27 04.8	10.534	17	12 42 34.70	1.9782	6 44 01.1	9.649
18	11 09 11.63	2.0097	1 16 32.8	10.533	18	12 44 33.40	1.9784	6 53 39.0	9.614
19	11 11 12.17	2.0082	1 06 00.8	10.532	19	12 46 32.11	1.9787	7 03 14.8	9.577
20	11 13 12.62	2.0067	0 55 29.0	10.529	20	12 48 30.84	1.9790	7 12 48.3	9.540
21	11 15 12.97	2.0051	0 44 57.3	10.526	21	12 50 29.59	1.9792	7 22 19.6	9.502
22	11 17 13.23	2.0037	0 34 25.9	10.522	22	12 52 28.35	1.9796	7 31 48.6	9.464
23	11 19 13.41	2.0022	0 23 54.7	10.517	23	12 54 27.14	1.9799	7 41 15.3	9.425
24	11 21 13.50	+2.0008	N. 0 13 23.9	−10.511	24	12 56 25.94	+1.9802	S. 7 50 39.6	−9.385

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 56 25.94	+ 1.9802	S. 7 50 39.6	− 9.385
1	12 58 24.77	1.9807	8 00 01.5	9.345
2	13 00 23.62	1.9811	8 09 21.0	9.304
3	13 02 22.50	1.9816	8 18 38.0	9.262
4	13 04 21.41	1.9820	8 27 52.5	9.221
5	13 06 20.34	1.9825	8 37 04.5	9.178
6	13 08 19.31	1.9831	8 46 13.9	9.134
7	13 10 18.31	1.9837	8 55 20.6	9.090
8	13 12 17.35	1.9842	9 04 24.7	9.046
9	13 14 16.42	1.9848	9 13 26.1	9.000
10	13 16 15.53	1.9854	9 22 24.7	8.954
11	13 18 14.67	1.9861	9 31 20.6	8.907
12	13 20 13.86	1.9868	9 40 13.6	8.860
13	13 22 13.09	1.9875	9 49 03.8	8.812
14	13 24 12.36	1.9882	9 57 51.1	8.764
15	13 26 11.68	1.9890	10 06 35.5	8.715
16	13 28 11.04	1.9897	10 15 16.9	8.665
17	13 30 10.44	1.9905	10 23 55.3	8.615
18	13 32 09.90	1.9913	10 32 30.7	8.564
19	13 34 09.40	1.9921	10 41 03.0	8.512
20	13 36 08.95	1.9930	10 49 32.2	8.461
21	13 38 08.56	1.9938	10 57 58.3	8.408
22	13 40 08.21	1.9947	11 06 21.2	8.355
23	13 42 07.92	+ 1.9957	S.11 14 40.9	− 8.301

TUESDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 44 07.69	+ 1.9966	S.11 22 57.3	− 8.247
1	13 46 07.51	1.9975	11 31 10.5	8.192
2	13 48 07.39	1.9984	11 39 20.3	8.136
3	13 50 07.32	1.9993	11 47 26.8	8.080
4	13 52 07.31	2.0003	11 55 29.9	8.023
5	13 54 07.36	2.0013	12 03 29.6	7.967
6	13 56 07.47	2.0023	12 11 25.9	7.909
7	13 58 07.64	2.0033	12 19 18.7	7.851
8	14 00 07.87	2.0043	12 27 08.0	7.792
9	14 02 08.16	2.0054	12 34 53.7	7.732
10	14 04 08.52	2.0065	12 42 35.8	7.672
11	14 06 08.94	2.0075	12 50 14.3	7.611
12	14 08 09.42	2.0086	12 57 49.1	7.550
13	14 10 09.97	2.0097	13 05 20.3	7.489
14	14 12 10.58	2.0107	13 12 47.8	7.427
15	14 14 11.26	2.0119	13 20 11.5	7.363
16	14 16 12.01	2.0131	13 27 31.4	7.301
17	14 18 12.83	2.0142	13 34 47.6	7.237
18	14 20 13.71	2.0152	13 41 59.9	7.172
19	14 22 14.66	2.0163	13 49 08.3	7.108
20	14 24 15.67	2.0175	13 56 12.9	7.043
21	14 26 16.76	2.0187	14 03 13.5	6.977
22	14 28 17.91	2.0198	14 10 10.1	6.911
23	14 30 19.13	2.0210	14 17 02.8	6.845
24	14 32 20.43	+ 2.0222	S.14 23 51.5	− 6.777

WEDNESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 32 20.43	+ 2.0222	S.14 23 51.5	− 6.777
1	14 34 21.79	2.0233	14 30 36.1	6.709
2	14 36 23.22	2.0245	14 37 16.6	6.642
3	14 38 24.73	2.0257	14 43 53.1	6.573
4	14 40 26.30	2.0267	14 50 25.4	6.503
5	14 42 27.94	2.0279	14 56 53.5	6.434
6	14 44 29.65	2.0291	15 03 17.5	6.364
7	14 46 31.43	2.0303	15 09 37.2	6.293
8	14 48 33.29	2.0316	15 15 52.7	6.222
9	14 50 35.22	2.0327	15 22 03.9	6.151
10	14 52 37.21	2.0338	15 28 10.8	6.079
11	14 54 39.28	2.0350	15 34 13.4	6.007
12	14 56 41.41	2.0362	15 40 11.7	5.935
13	14 58 43.62	2.0373	15 46 05.6	5.862
14	15 00 45.89	2.0385	15 51 55.1	5.787
15	15 02 48.24	2.0397	15 57 40.1	5.713
16	15 04 50.65	2.0408	16 03 20.7	5.639
17	15 06 53.13	2.0420	16 08 56.8	5.564
18	15 08 55.69	2.0432	16 14 28.4	5.489
19	15 10 58.31	2.0442	16 19 55.5	5.413
20	15 13 01.00	2.0454	16 25 18.0	5.337
21	15 15 03.76	2.0465	16 30 36.0	5.262
22	15 17 06.58	2.0476	16 35 49.4	5.185
23	15 19 09.47	+ 2.0487	S.16 40 58.2	− 5.107

THURSDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 21 12.43	+ 2.0499	S.16 46 02.3	− 5.030
1	15 23 15.46	2.0510	16 51 01.8	4.952
2	15 25 18.55	2.0520	16 55 56.6	4.873
3	15 27 21.70	2.0531	17 00 46.6	4.795
4	15 29 24.92	2.0542	17 05 32.0	4.717
5	15 31 28.20	2.0552	17 10 12.6	4.637
6	15 33 31.55	2.0563	17 14 48.4	4.557
7	15 35 34.96	2.0573	17 19 19.5	4.477
8	15 37 38.43	2.0583	17 23 45.7	4.397
9	15 39 41.96	2.0593	17 28 07.1	4.316
10	15 41 45.55	2.0603	17 32 23.6	4.235
11	15 43 49.20	2.0613	17 36 35.3	4.154
12	15 45 52.91	2.0623	17 40 42.1	4.072
13	15 47 56.68	2.0632	17 44 44.0	3.991
14	15 50 00.50	2.0642	17 48 41.0	3.908
15	15 52 04.38	2.0652	17 52 33.0	3.826
16	15 54 08.32	2.0661	17 56 20.1	3.743
17	15 56 12.31	2.0670	18 00 02.2	3.660
18	15 58 16.36	2.0679	18 03 39.3	3.577
19	16 00 20.46	2.0687	18 07 11.4	3.493
20	16 02 24.61	2.0696	18 10 38.5	3.410
21	16 04 28.81	2.0704	18 14 00.6	3.326
22	16 06 33.06	2.0712	18 17 17.6	3.241
23	16 08 37.36	2.0721	18 20 29.5	3.157
24	16 10 41.71	+ 2.0729	S.18 23 36.4	− 3.072

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″

FRIDAY 25.   SUNDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 10 41.71	+ 2.0729	S. 18 23 36.4	− 3.072	0	17 50 44.20	+ 2.0878	S. 19 10 29.3	+ 1.149
1	16 12 46.11	2.0737	18 26 38.2	2.987	1	17 52 49.47	2.0877	19 09 17.7	1.237
2	16 14 50.55	2.0743	18 29 34.9	2.902	2	17 54 54.73	2.0876	19 08 00.8	1.326
3	16 16 55.03	2.0751	18 32 26.5	2.817	3	17 56 59.98	2.0873	19 06 38.6	1.415
4	16 18 59.56	2.0758	18 35 12.9	2.731	4	17 59 05.21	2.0871	19 05 11.0	1.504
5	16 21 04.13	2.0765	18 37 54.2	2.645	5	18 01 10.43	2.0869	19 03 38.1	1.592
6	16 23 08.74	2.0772	18 40 30.3	2.559	6	18 03 15.64	2.0867	19 02 00.0	1.679
7	16 25 13.40	2.0779	18 43 01.3	2.473	7	18 05 20.83	2.0863	19 00 16.6	1.767
8	16 27 18.09	2.0785	18 45 27.1	2.387	8	18 07 26.00	2.0861	18 58 27.9	1.856
9	16 29 22.82	2.0792	18 47 47.7	2.300	9	18 09 31.16	2.0858	18 56 33.9	1.944
10	16 31 27.59	2.0797	18 50 03.1	2.213	10	18 11 36.30	2.0855	18 54 34.6	2.032
11	16 33 32.39	2.0802	18 52 13.3	2.126	11	18 13 41.42	2.0852	18 52 30.1	2.119
12	16 35 37.22	2.0808	18 54 18.2	2.039	12	18 15 46.53	2.0849	18 50 20.3	2.207
13	16 37 42.09	2.0814	18 56 18.0	1.952	13	18 17 51.61	2.0845	18 48 05.2	2.295
14	16 39 46.99	2.0820	18 58 12.5	1.864	14	18 19 56.67	2.0842	18 45 44.9	2.382
15	16 41 51.93	2.0825	19 00 01.7	1.777	15	18 22 01.71	2.0837	18 43 19.4	2.468
16	16 43 56.89	2.0829	19 01 45.7	1.689	16	18 24 06.72	2.0833	18 40 48.7	2.556
17	16 46 01.88	2.0834	19 03 24.4	1.602	17	18 26 11.71	2.0830	18 38 12.7	2.643
18	16 48 06.90	2.0839	19 04 57.9	1.514	18	18 28 16.68	2.0826	18 35 31.5	2.730
19	16 50 11.95	2.0843	19 06 26.1	1.426	19	18 30 21.62	2.0822	18 32 45.1	2.817
20	16 52 17.02	2.0847	19 07 49.0	1.337	20	18 32 26.54	2.0817	18 29 53.5	2.903
21	16 54 22.12	2.0851	19 09 06.6	1.249	21	18 34 31.43	2.0812	18 26 56.7	2.989
22	16 56 27.23	2.0854	19 10 18.9	1.151	22	18 36 36.29	2.0808	18 23 54.8	3.075
23	16 58 32.37	+ 2.0858	S. 19 11 25.9	− 1.072	23	18 38 41.13	+ 2.0804	S. 18 20 47.7	+ 3.162

SATURDAY 26.   MONDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 00 37.53	+ 2.0862	S. 19 12 27.6	− 0.984	0	18 40 45.94	+ 2.0799	S. 18 17 35.4	+ 3.247
1	17 02 42.71	2.0865	19 13 24.0	0.895	1	18 42 50.72	2.0794	18 14 18.0	3.332
2	17 04 47.91	2.0867	19 14 15.1	0.807	2	18 44 55.47	2.0789	18 10 55.5	3.417
3	17 06 53.12	2.0869	19 15 00.9	0.718	3	18 47 00.19	2.0785	18 07 27.9	3.503
4	17 08 58.34	2.0872	19 15 41.3	0.629	4	18 49 04.89	2.0780	18 03 55.1	3.588
5	17 11 03.58	2.0875	19 16 16.4	0.541	5	18 51 09.55	2.0774	18 00 17.3	3.673
6	17 13 08.84	2.0877	19 16 46.2	0.452	6	18 53 14.18	2.0770	17 56 34.3	3.758
7	17 15 14.10	2.0878	19 17 10.6	0.362	7	18 55 18.79	2.0765	17 52 46.3	3.842
8	17 17 19.38	2.0881	19 17 29.7	0.274	8	18 57 23.36	2.0759	17 48 53.3	3.926
9	17 19 24.67	2.0882	19 17 43.5	0.185	9	18 59 27.90	2.0754	17 44 55.2	4.010
10	17 21 29.96	2.0882	19 17 51.9	0.095	10	19 01 32.41	2.0749	17 40 52.1	4.093
11	17 23 35.26	2.0883	19 17 55.0	− 0.007	11	19 03 36.89	2.0744	17 36 44.0	4.177
12	17 25 40.56	2.0884	19 17 52.8	+ 0.082	12	19 05 41.34	2.0739	17 32 30.9	4.260
13	17 27 45.87	2.0885	19 17 45.2	0.171	13	19 07 45.76	2.0733	17 28 12.8	4.343
14	17 29 51.18	2.0885	19 17 32.3	0.260	14	19 09 50.14	2.0727	17 23 49.7	4.427
15	17 31 56.49	2.0886	19 17 14.0	0.349	15	19 11 54.49	2.0722	17 19 21.6	4.509
16	17 34 01.81	2.0886	19 16 50.4	0.438	16	19 13 58.81	2.0717	17 14 48.6	4.591
17	17 36 07.12	2.0885	19 16 21.4	0.527	17	19 16 03.10	2.0712	17 10 10.7	4.672
18	17 38 12.43	2.0885	19 15 47.1	0.616	18	19 18 07.35	2.0706	17 05 27.9	4.754
19	17 40 17.74	2.0885	19 15 07.5	0.703	19	19 20 11.57	2.0701	17 00 40.2	4.836
20	17 42 23.05	2.0884	19 14 22.5	0.794	20	19 22 15.76	2.0696	16 55 47.6	4.917
21	17 44 28.35	2.0882	19 13 32.2	0.882	21	19 24 19.92	2.0691	16 50 50.1	4.998
22	17 46 33.64	2.0882	19 12 36.6	0.972	22	19 26 24.05	2.0686	16 45 47.8	5.079
23	17 48 38.93	2.0880	19 11 35.6	1.061	23	19 28 28.15	2.0680	16 40 40.6	5.160
24	17 50 44.20	+ 2.0878	S. 19 10 29.3	+ 1.149	24	19 30 32.21	+ 2.0674	S. 16 35 28.6	+ 5.240

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 29.					**THURSDAY, MAY 1.**			
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 30 32.21	+ 2.0674	S. 16 35 28.6	+ 5.240	0	21 09 23.54	+ 2.0586	S. 10 57 54.4	+ 8.681
1	19 32 36.24	2.0669	16 30 11.8	5.319					
2	19 34 40.24	2.0664	16 24 50.3	5.398					
3	19 36 44.21	2.0659	16 19 24.0	5.478					
4	19 38 48.15	2.0654	16 13 52.9	5.557					
5	19 40 52.06	2.0650	16 08 17.1	5.636					
6	19 42 55.95	2.0645	16 02 36.6	5.714					
7	19 44 59.80	2.0640	15 56 51.4	5.792					
8	19 47 03.63	2.0635	15 51 01.5	5.870					
9	19 49 07.42	2.0630	15 45 07.0	5.947					
10	19 51 11.19	2.0627	15 39 07.8	6.025					
11	19 53 14.94	2.0622	15 33 04.0	6.102					
12	19 55 18.66	2.0617	15 26 55.6	6.178					
13	19 57 22.35	2.0613	15 20 42.6	6.254					
14	19 59 26.02	2.0609	15 14 25.1	6.329					
15	20 01 29.66	2.0605	15 08 03.1	6.405					
16	20 03 33.28	2.0602	15 01 36.5	6.481			**PHASES OF THE MOON.**			
17	20 05 36.88	2.0598	14 55 05.4	6.556					
18	20 07 40.46	2.0595	14 48 29.8	6.630					
19	20 09 44.02	2.0592	14 41 49.8	6.703					
20	20 11 47.56	2.0588	14 35 05.4	6.777					
21	20 13 51.08	2.0585	14 28 16.5	6.851					
22	20 15 54.58	2.0582	14 21 23.3	6.923					
23	20 17 58.07	+ 2.0580	S.14 14 25.7	+ 6.997					
	WEDNESDAY 30.								
0	20 20 01.54	+ 2.0577	S.14 07 23.7	+ 7.069					
1	20 22 05.00	2.0575	14 00 17.4	7.141					
2	20 24 08.44	2.0572	13 53 06.8	7.212					
3	20 26 11.87	2.0571	13 45 51.9	7.283					
4	20 28 15.29	2.0569	13 38 32.8	7.353					
5	20 30 18.70	2.0567	13 31 09.5	7.424					
6	20 32 22.10	2.0566	13 23 41.9	7.495					
7	20 34 25.49	2.0565	13 16 10.1	7.564					
8	20 36 28.88	2.0565	13 08 34.2	7.633					
9	20 38 32.27	2.0564	13 00 54.1	7.702					
10	20 40 35.65	2.0563	12 53 10.0	7.770					
11	20 42 39.03	2.0563	12 45 21.7	7.838					
12	20 44 42.41	2.0563	12 37 29.4	7.906					
13	20 46 45.79	2.0564	12 29 33.0	7.973					
14	20 48 49.18	2.0565	12 21 32.6	8.039					
15	20 50 52.57	2.0565	12 13 28.3	8.105					
16	20 52 55.96	2.0566	12 05 20.0	8.171					
17	20 54 59.36	2.0568	11 57 07.8	8.237					
18	20 57 02.78	2.0570	11 48 51.6	8.302					
19	20 59 06.20	2.0572	11 40 31.6	8.365					
20	21 01 09.64	2.0574	11 32 07.8	8.429					
21	21 03 13.09	2.0577	11 23 40.1	8.493					
22	21 05 16.56	2.0579	11 15 08.6	8.556					
23	21 07 20.04	2.0582	11 06 33.4	8.618					
24	21 09 23.54	+ 2.0586	S.10 57 54.4	+ 8.681					

PHASES OF THE MOON.

			d	h	m
●	New Moon	April	8	01	50.1
☽	First Quarter		14	17	25.7
○	Full Moon		22	06	49.6
☾	Last Quarter		30	10	58.0

			d	h
☾	Perigee	April	10	01.0
☾	Apogee		25	19.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Noon. ° ′ ″	P. L. of Diff.	IIIʰ. ° ′ ″	P. L. of Diff.	VIʰ. ° ′ ″	P. L. of Diff.	IXʰ. ° ′ ″	P. L. of Diff.
1	Spica	W.	81 09 09	2973	82 39 55	2963	84 10 54	2953	85 42 06	2942
	Antares	W.	36 14 00	3074	37 42 41	3059	39 11 41	3043	40 41 01	3026
	VENUS	E.	44 04 55	3242	42 39 36	3233	41 14 06	3223	39 48 24	3214
	SUN	E.	87 24 56	3344	86 01 35	3332	84 38 01	3321	83 14 14	3310
2	Spica	W.	93 21 40	2882	94 54 22	2869	96 27 20	2855	98 00 36	2841
	Antares	W.	48 12 38	2947	49 43 57	2931	51 15 36	2914	52 47 37	2898
	VENUS	E.	32 36 49	3158	31 09 49	3145	29 42 34	3133	28 15 04	3121
	SUN	E.	76 11 44	3244	74 46 27	3230	73 20 53	3215	71 55 02	3199
3	Spica	W.	105 51 37	2767	107 26 48	2751	109 02 20	2735	110 38 13	2719
	Antares	W.	60 32 56	2815	62 07 05	2798	63 41 36	2780	65 16 30	2763
	SUN	E.	64 41 03	3119	63 13 16	3101	61 45 08	3084	60 16 39	3067
4	Antares	W.	73 16 48	2674	74 54 03	2656	76 31 42	2638	78 09 45	2621
	SATURN	W.	24 43 39	2747	26 19 17	2720	27 55 30	2694	29 32 18	2669
	SUN	E.	52 48 44	2976	51 18 01	2957	49 46 54	2939	48 15 24	2920
5	Antares	W.	86 26 03	2532	88 06 32	2515	89 47 25	2497	91 28 42	2480
	SATURN	W.	37 44 19	2557	39 24 13	2536	41 04 36	2516	42 45 27	2497
	SUN	E.	40 31 54	2826	38 58 00	2808	37 23 42	2789	35 49 00	2772
9	SUN	W.	12 37 44	2425	14 20 43	2417	16 03 54	2410	17 47 15	2403
	Pollux	E.	80 34 24	2198	78 45 53	2196	76 57 19	2194	75 08 42	2193
	Regulus	E.	117 08 41	2126	115 18 21	2120	113 27 52	2116	111 37 17	2113
10	SUN	W.	26 25 33	2392	28 09 19	2392	29 53 05	2393	31 36 50	2395
	Pollux	E.	66 05 46	2202	64 17 22	2207	62 29 05	2213	60 40 57	2220
	Regulus	E.	102 23 36	2108	100 32 49	2109	98 42 04	2111	96 51 21	2112
11	SUN	W.	40 14 32	2415	41 57 46	2420	43 40 52	2426	45 23 50	2433
	Pollux	E.	51 43 22	2271	49 56 40	2285	48 10 19	2301	46 24 21	2319
	Regulus	E.	87 38 52	2132	85 48 42	2137	83 58 40	2144	82 08 48	2150
12	SUN	W.	53 56 02	2473	55 37 53	2482	57 19 31	2492	59 00 56	2502
	Regulus	E.	73 02 09	2190	71 13 27	2200	69 24 59	2209	67 36 45	2218
	Spica	E.	126 43 15	2170	124 54 03	2179	123 05 04	2188	121 16 19	2198
13	SUN	W.	67 24 24	2556	69 04 20	2568	70 43 59	2579	72 23 23	2591
	Aldebaran	W.	21 29 24	2276	23 15 59	2283	25 02 23	2292	26 48 34	2301
	Regulus	E.	58 39 25	2274	56 52 47	2286	55 06 27	2298	53 20 24	2311
	Spica	E.	112 16 12	2249	110 28 57	2260	108 41 58	2270	106 55 15	2281
14	SUN	W.	80 36 13	2652	82 13 57	2666	83 51 23	2678	85 28 33	2689
	Aldebaran	W.	35 36 09	2350	37 20 55	2361	39 05 26	2372	40 49 41	2383
	Regulus	E.	44 34 53	2378	42 50 46	2391	41 06 59	2407	39 23 34	2422
	Spica	E.	98 05 48	2339	96 20 45	2351	94 36 00	2363	92 51 32	2374
15	SUN	W.	93 30 11	2753	95 05 40	2767	96 40 51	2779	98 15 47	2792
	Aldebaran	W.	49 26 54	2440	51 09 32	2451	52 51 54	2462	54 34 00	2474
	Spica	E.	84 13 23	2433	82 30 36	2445	80 48 06	2457	79 05 52	2468
	Antares	E.	129 24 18	2494	127 42 56	2503	126 01 47	2512	124 20 51	2522

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Spica W.	87 13 31	2931	88 45 11	2920	90 17 05	2907	91 49 15	2895
	Antares W.	42 10 41	3010	43 40 41	2996	45 10 59	2979	46 41 38	2962
	VENUS E.	38 22 31	3203	36 56 25	3193	35 30 07	3181	34 03 35	3169
	SUN E.	81 50 14	3297	80 25 59	3285	79 01 30	3271	77 36 45	3258
2	Spica W.	99 34 11	2827	101 08 04	2813	102 42 15	2798	104 16 46	2782
	Antares W.	54 19 58	2882	55 52 40	2865	57 25 44	2848	58 59 09	2831
	VENUS E.	26 47 20	3109	25 19 21	3096	23 51 06	3083	22 22 36	3069
	SUN E.	70 28 52	3184	69 02 24	3168	67 35 37	3152	66 08 30	3135
3	Spica W.	112 14 28	2702	113 51 05	2686	115 28 04	2669	117 05 26	2652
	Antares W.	66 51 47	2745	68 27 27	2728	70 03 30	2710	71 39 57	2692
	SUN E.	58 47 49	3049	57 18 37	3030	55 49 02	3013	54 19 05	2993
4	Antares W.	79 48 12	2603	81 27 03	2585	83 06 19	2567	84 45 59	2550
	SATURN W.	31 09 39	2645	32 47 33	2622	34 25 58	2599	36 04 54	2578
	SUN E.	46 43 30	2901	45 11 12	2882	43 38 30	2863	42 05 24	2845
5	Antares W.	93 10 23	2463	94 52 28	2446	96 34 57	2431	98 17 48	2415
	SATURN W.	44 26 45	2477	46 08 30	2458	47 50 42	2440	49 33 20	2422
	SUN E.	34 13 55	2752	32 38 26	2735	31 02 33	2718	29 26 17	2701
9	SUN W.	19 30 45	2398	21 14 22	2395	22 58 04	2394	24 41 48	2393
	Pollux E.	73 20 04	2193	71 31 26	2194	69 42 49	2196	67 54 15	2199
	Regulus E.	109 46 38	2111	107 55 56	2109	106 05 11	2108	104 14 24	2107
10	SUN W.	33 20 32	2398	35 04 10	2401	36 47 43	2405	38 31 11	2410
	Pollux E.	58 52 59	2228	57 05 13	2237	55 17 40	2247	53 30 22	2259
	Regulus E.	95 00 40	2115	93 10 04	2119	91 19 34	2123	89 29 10	2127
11	SUN W.	47 06 38	2440	48 49 16	2448	50 31 42	2455	52 13 58	2464
	Pollux E.	44 38 49	2338	42 53 45	2360	41 09 13	2384	39 25 15	2410
	Regulus E.	80 19 05	2157	78 29 33	2165	76 40 13	2173	74 51 05	2181
12	SUN W.	60 42 07	2512	62 23 04	2523	64 03 45	2533	65 44 12	2544
	Regulus E.	65 48 45	2229	64 01 01	2240	62 13 33	2251	60 26 21	2262
	Spica E.	119 27 48	2208	117 39 32	2218	115 51 30	2227	114 03 43	2238
13	SUN W.	74 02 30	2603	75 41 21	2615	77 19 55	2628	78 58 12	2640
	Aldebaran W.	28 34 32	2309	30 20 18	2319	32 05 50	2329	33 51 07	339
	Regulus E.	51 34 40	2323	49 49 14	2337	48 04 08	2350	46 19 21	2363
	Spica E.	105 08 48	2293	103 22 38	2304	101 36 45	2315	99 51 08	2327
14	SUN W.	87 05 27	2703	88 42 03	2716	90 18 22	2728	91 54 25	2741
	Aldebaran W.	42 33 40	2394	44 17 23	2406	46 00 49	2417	47 44 00	2429
	Regulus E.	37 40 30	2438	35 57 49	2454	34 15 31	2471	32 33 37	2488
	Spica E.	91 07 20	2387	89 23 26	2398	87 39 48	2410	85 56 27	2422
15	SUN W.	99 50 26	2804	101 24 49	2816	102 58 56	2828	104 32 47	2840
	Aldebaran W.	56 15 50	2485	57 57 24	2497	59 38 42	2508	61 19 44	2519
	Spica E.	77 23 54	2480	75 42 12	2492	74 00 48	2503	72 19 39	2514
	Antares E.	122 40 08	2531	120 59 38	2541	119 19 22	2551	117 39 19	2561

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
16	Sun W.	106 06 23	2852	107 39 43	2865	109 12 47	2876	110 45 37	2888
	Aldebaran W.	63 00 31	2530	65 41 02	2541	66 21 18	2551	68 01 20	2563
	Spica E.	70 38 45	2525	68 58 07	2537	67 17 45	2548	65 37 38	2559
	Antares E.	115 59 30	2571	114 19 55	2580	112 40 33	2591	111 01 25	2600
17	Sun W.	118 26 02	2945	119 57 24	2957	121 28 31	2967	122 59 25	2977
	Aldebaran W.	76 17 43	2615	77 56 17	2626	79 34 37	2635	81 12 44	2645
	Pollux W.	35 08 18	2894	36 40 44	2883	38 13 24	2876	39 46 14	2870
	Spica E.	57 20 47	2612	55 42 08	2623	54 03 44	2632	52 25 33	2642
	Antares E.	102 49 08	2650	101 11 21	2660	99 33 47	2669	97 56 26	2680
18	Aldebaran W.	89 19 59	2694	90 56 47	2704	92 33 22	2713	94 09 45	2722
	Pollux W.	47 31 43	2860	49 04 53	2862	50 38 01	2864	52 11 07	2866
	Spica E.	44 17 59	2691	42 41 07	2701	41 04 28	2710	39 28 01	2719
	Antares E.	89 52 57	2727	88 16 53	2737	86 41 02	2746	85 05 23	2756
19	Aldebaran W.	102 08 42	2766	103 43 55	2775	105 18 56	2783	106 53 46	2792
	Pollux W.	59 55 35	2885	61 28 13	2891	63 00 44	2895	64 33 09	2900
	Regulus W.	22 53 08	2877	24 25 56	2875	25 58 47	2873	27 31 41	2871
	Spica E.	31 28 48	2764	29 53 33	2772	28 18 29	2782	26 43 37	2790
	Antares E.	77 10 12	2801	75 35 46	2810	74 01 31	2819	72 27 28	2828
	a Aquilæ E.	125 41 16	3377	124 18 33	3364	122 55 35	3351	121 32 23	3341
	Saturn E.	126 25 42	2799	124 51 13	2807	123 16 54	2814	121 42 44	2821
20	Aldebaran W.	114 45 15	2832	116 19 01	2841	117 52 36	2848	119 26 01	2855
	Pollux W.	72 13 29	2930	73 45 10	2936	75 16 44	2942	76 48 10	2949
	Regulus W.	35 16 06	2881	36 48 49	2885	38 21 27	2890	39 53 59	2894
	Antares E.	64 40 09	2874	63 07 17	2883	61 34 36	2892	60 02 07	2901
	Saturn E.	113 54 20	2859	112 21 08	2866	110 48 05	2873	109 15 11	2880
	a Aquilæ E.	114 33 48	3307	113 09 45	3304	111 45 38	3300	110 21 27	3300
21	Pollux W.	84 23 15	2981	85 53 51	2989	87 24 18	2995	88 54 37	3002
	Regulus W.	47 35 05	2920	49 06 58	2927	50 38 43	2932	52 10 21	2938
	Antares E.	52 22 38	2949	50 51 21	2958	49 20 16	2969	47 49 24	2979
	Saturn E.	101 33 01	2916	100 01 02	2923	98 29 12	2929	96 57 30	2936
	a Aquilæ E.	103 20 27	3303	101 56 19	3306	100 32 14	3309	99 08 12	3312
	Jupiter E.	118 04 16	2962	116 33 15	2968	115 02 22	2974	113 31 37	2980
22	Pollux W.	96 24 00	3038	97 53 26	3045	99 22 43	3052	100 51 52	3059
	Regulus W.	59 46 42	2967	61 17 36	2973	62 48 23	2978	64 19 03	2984
	Spica W.	5 56 48	2981	7 27 25	2980	8 58 03	2980	10 28 41	2981
	Antares E.	40 18 25	3036	38 48 57	3048	37 19 44	3062	35 50 48	3077
	Saturn E.	89 21 11	2970	87 50 21	2976	86 19 38	2982	84 49 03	2989
	a Aquilæ E.	92 09 14	3337	90 45 45	3343	89 22 23	3349	87 59 08	3356
	Jupiter E.	105 59 49	3012	104 29 51	3018	103 00 01	3024	101 30 18	3030
23	Pollux W.	108 15 21	3096	109 43 35	3104	111 11 40	3111	112 39 36	3119
	Regulus W.	71 50 36	3012	73 20 34	3017	74 50 25	3022	76 20 11	3027
	Spica W.	18 01 18	2997	19 31 35	3002	21 01 45	3006	22 31 50	3011
	Saturn E.	77 18 05	3019	75 48 16	3025	74 18 34	3030	72 48 59	3036
	a Aquilæ E.	81 05 03	3397	79 42 43	3408	78 20 35	3416	76 58 37	3427
	Jupiter E.	94 03 32	3059	92 34 32	3064	91 05 39	3069	89 36 52	3075

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVᵇ.	P. L. of Diff.	XVIIIᵇ.	P. L. of Diff.	XXIᵇ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
16	Sun	W.	112 18 11	2900	113 50 30	2911	115 22 35	2922	116 54 26	2934
	Aldebaran	W.	69 41 06	2574	71 20 37	2585	72 59 53	2595	74 38 55	2605
	Spica	E.	63 57 46	2569	62 18 09	2581	60 38 48	2591	58 59 41	2601
	Antares	E.	109 22 30	2610	107 43 49	2621	106 05 22	2630	104 27 08	2640
17	Sun	W.	124 30 06	2989	126 00 33	2999	127 30 47	3009	129 00 48	3019
	Aldebaran	W.	82 50 38	2655	84 28 18	2666	86 05 44	2675	87 42 58	2684
	Pollux	W.	41 19 12	2865	42 52 16	2862	44 25 23	2861	45 58 32	2859
	Spica	E.	50 47 35	2652	49 09 51	2663	47 32 21	2672	45 55 04	2681
	Antares	E.	96 19 19	2689	94 42 24	2699	93 05 43	2708	91 29 14	2717
18	Aldebaran	W.	95 45 56	2731	97 21 55	2740	98 57 42	2748	100 33 18	2757
	Pollux	W.	53 44 10	2869	55 17 08	2873	56 50 02	2876	58 22 51	2880
	Spica	E.	37 51 46	2728	36 15 43	2738	34 39 53	2747	33 04 15	2755
	Antares	E.	83 29 57	2765	81 54 43	2774	80 19 41	2783	78 44 51	2792
19	Aldebaran	W.	108 28 25	2799	110 02 54	2808	111 37 11	2816	113 11 18	2824
	Pollux	W.	66 05 28	2906	67 37 39	2912	69 09 43	2918	70 41 40	2924
	Regulus	W.	29 04 37	2871	30 37 33	2873	32 10 27	2875	33 43 18	2877
	Spica	E.	25 08 56	2798	23 34 26	2808	22 00 08	2816	20 26 01	2825
	Antares	E.	70 53 36	2838	69 19 57	2846	67 46 29	2855	66 13 13	2865
	α Aquilæ	E.	120 08 59	3332	118 45 24	3324	117 21 40	3317	115 57 47	3311
	Saturn	E.	120 08 44	2829	118 34.54	2836	117 01 13	2844	115 27 42	2851
20	Aldebaran	W.	120 59 17	2864	122 32 22	2871	124 05 18	2879	125 38 04	2886
	Pollux	W.	78 19 27	2955	79 50 36	2962	81 21 37	2968	82 52 30	2974
	Regulus	W.	41 26 26	2899	42 58 46	2905	44 30 59	2910	46 03 05	2915
	Antares	E.	58 29 49	2911	56 57 44	2920	55 25 50	2929	53 54 08	2939
	Saturn	E.	107 42 27	2887	106 09 52	2894	104 37 26	2901	103 05 09	2909
	α Aquilæ	E.	108 57 15	3300	107 33 03	3299	106 08 50	3300	104 44 38	3300
21	Pollux	W.	90 24 47	3009	91 54 48	3016	93 24 41	3023	94 54 25	3030
	Regulus	W.	53 41 52	2944	55 13 15	2950	56 44 31	2955	58 15 40	2961
	Antares	E.	46 18 45	2989	44 48 19	3001	43 18 07	3012	41 48 09	3023
	Saturn	E.	95 25 57	2943	93 54 33	2950	92 23 17	2957	90 52 10	2963
	α Aquilæ	E.	97 44 14	3316	96 20 21	3320	94 56 33	3325	93 32 50	3331
	Jupiter	E.	112 00 59	2987	110 30 30	2993	109 00 09	2999	107 29 55	3005
22	Pollux	W.	102 20 52	3066	103 49 43	3074	105 18 24	3081	106 46 57	3088
	Regulus	W.	65 49 36	2989	67 20 02	2996	68 50 20	3001	70 20 31	3006
	Spica	W.	11 59 18	2982	13 29 53	2984	15 00 26	2987	16 30 55	2992
	Antares	E.	34 22 10	3092	32 53 51	3110	31 25 53	3127	29 58 16	3146
	Saturn	E.	83 18 36	2995	81 48 17	3001	80 18 06	3007	78 48 02	3013
	α Aquilæ	E.	86 36 01	3364	85 13 03	3371	83 50 13	3379	82 27 33	3388
	Jupiter	E.	100 00 42	3036	98 31 14	3042	97 01 53	3047	95 32 39	3053
23	Pollux	W.	114 07 23	3127	115 35 00	3135	117 02 27	3143	118 29 45	3151
	Regulus	W.	77 49 50	3032	79 19 23	3037	80 48 50	3041	82 18 12	3046
	Spica	W.	24 01 49	3017	25 31 41	3022	27 01 27	3026	28 31 08	3030
	Saturn	E.	71 19 31	3042	69 50 10	3047	68 20 56	3052	66 51 47	3057
	α Aquilæ	E.	75 36 51	3438	74 15 17	3450	72 53 57	3461	71 32 49	3473
	Jupiter	E.	88 08 12	3080	86 39 38	3085	85 11 10	3090	83 42 48	3095

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
24	Regulus	W.	83 47 28	3051	85 16 38	3055	86 45 43	3059	88 14 43	3063
	Spica	W.	30 00 43	3034	31 30 14	3038	32 59 40	3042	34 29 01	3045
	SATURN	E.	65 22 45	3062	63 53 49	3067	62 24 59	3071	60 56 14	3076
	α Aquilæ	E.	70 11 55	3486	68 51 15	3500	67 30 51	3514	66 10 42	3529
	JUPITER	E.	82 14 32	3099	80 46 21	3104	79 18 16	3108	77 50 16	3112
	Fomalhaut	E.	100 06 27	3500	98 46 03	3500	97 25 39	3502	96 05 17	3505
	α Pegasi	E.	117 22 08	3243	115 56 50	3242	114 31 31	3242	113 06 11	3242
25	Regulus	W.	95 38 36	3079	97 07 11	3082	98 35 42	3085	100 04 10	3087
	Spica	W.	41 54 39	3064	43 23 33	3065	44 52 25	3066	46 21 17	3068
	SATURN	E.	53 33 52	3097	52 05 39	3101	50 37 30	3104	49 09 25	3108
	α Aquilæ	E.	59 34 24	3617	58 16 08	3637	56 58 14	3660	55 40 44	3684
	JUPITER	E.	70 31 27	3130	69 03 54	3133	67 36 25	3135	66 08 58	3138
	Fomalhaut	E.	89 24 01	3516	88 03 55	3519	86 43 52	3523	85 23 53	3527
	α Pegasi	E.	105 59 28	3241	104 34 07	3242	103 08 47	3242	101 43 27	3242
26	Regulus	W.	107 25 57	3094	108 54 14	3096	110 22 29	3095	111 50 45	3096
	Spica	W.	53 44 59	3074	55 13 40	3075	56 42 20	3075	58 11 00	3074
	SATURN	E.	41 50 01	3122	40 22 18	3125	38 54 39	3129	37 27 04	3132
	α Aquilæ	E.	49 20 03	3828	48 05 30	3864	46 51 34	3904	45 38 18	3947
	JUPITER	E.	58 52 29	3148	57 25 17	3149	55 58 07	3150	54 30 58	3151
	Fomalhaut	E.	78 45 11	3551	77 25 43	3557	76 06 22	3564	74 47 08	3570
	α Pegasi	E.	94 36 50	3242	93 11 31	3242	91 46 11	3242	90 20 51	3242
27	Spica	W.	65 34 36	3068	67 03 25	3065	68 32 17	3062	70 01 13	3059
	Antares	W.	21 17 30	3346	22 40 48	3314	24 04 43	3285	25 29 12	3259
	α Aquilæ	E.	39 44 07	4233	38 36 12	4310	37 29 29	4395	36 24 03	4491
	JUPITER	E.	47 15 22	3152	45 48 15	3151	44 21 08	3150	42 53 59	3149
	Fomalhaut	E.	68 12 54	3610	66 54 30	3620	65 36 17	3631	64 18 16	3641
	VENUS	E.	82 20 16	3457	80 59 04	3454	79 37 49	3452	78 16 31	3448
	α Pegasi	E.	83 14 01	3237	81 48 36	3236	80 23 10	3235	78 57 42	3234
	SUN	E.	128 21 08	3437	126 59 33	3434	125 37 56	3431	124 16 15	3428
28	Spica	W.	77 26 59	3038	78 56 25	3032	80 25 58	3026	81 55 39	3019
	Antares	W.	32 38 20	3163	34 05 13	3148	35 32 25	3133	36 59 54	3120
	JUPITER	E.	35 38 02	3146	34 10 48	3146	32 43 34	3145	31 16 19	3145
	Fomalhaut	E.	57 51 26	3712	56 34 52	3730	55 18 36	3750	54 02 42	3773
	VENUS	E.	71 29 00	3427	70 07 15	3422	68 45 23	3415	67 23 24	3409
	α Pegasi	E.	71 49 56	3225	70 24 16	3223	68 58 34	3220	67 32 49	3218
	SUN	E.	117 26 41	3404	116 04 29	3398	114 42 10	3392	113 19 44	3384
29	Spica	W.	89 26 15	2981	90 56 52	2972	92 27 40	2962	93 58 40	2952
	Antares	W.	44 21 20	3056	45 50 24	3043	47 19 44	3030	48 49 20	3017
	α Pegasi	E.	60 23 26	3208	58 57 26	3206	57 31 24	3204	56 05 20	3204
	VENUS	E.	60 31 31	3371	59 08 41	3361	57 45 40	3351	56 22 28	3342
	SUN	E.	106 25 21	3342	105 01 58	3333	103 38 25	3322	102 14 39	3312
30	Spica	W.	101 36 57	2897	103 09 20	2884	104 41 59	2871	106 14 55	2859
	Antares	W.	56 21 26	2950	57 52 42	2935	59 24 16	2920	60 56 09	2906
	α Pegasi	E.	48 54 58	3208	47 28 58	3211	46 03 02	3216	44 37 11	3222
	VENUS	E.	49 23 29	3286	47 59 02	3274	46 34 20	3261	45 09 23	3248
	SUN	E.	95 12 33	3251	93 47 24	3237	92 21 59	3224	90 56 18	3209

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVʰ.	P. L. of Diff.	XVIIIʰ.	P. L. of Diff.	XXIʰ.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
24	Regulus W.	89 43 38	3066	91 12 29	3070	92 41 15	3073	94 09 57	3076
	Spica W.	35 58 18	3049	37 27 30	3053	38 56 37	3056	40 25 40	3060
	Saturn E.	59 27 35	3081	57 59 02	3085	56 30 34	3089	55 02 11	3092
	α Aquilæ E.	64 50 50	3545	63 31 15	3561	62 11 58	3579	60 53 01	3598
	Jupiter E.	76 22 21	3116	74 54 31	3120	73 26 46	3123	71 59 05	3126
	Fomalhaut E.	94 44 58	3506	93 24 40	3507	92 04 24	3510	90 44 11	3513
	α Pegasi E.	111 40 51	3242	110 15 31	3241	108 50 10	3241	107 24 49	3241
25	Regulus W.	101 32 36	3089	103 00 59	3091	104 29 20	3092	105 57 39	3093
	Spica W.	47 50 06	3070	49 18 52	3073	50 47 35	3073	52 16 17	3073
	Saturn E.	47 41 25	3111	46 13 29	3114	44 45 36	3117	43 17 47	3119
	α Aquilæ E.	54 23 39	3709	53 07 01	3735	51 50 51	3764	50 35 11	3795
	Jupiter E.	64 41 35	3141	63 14 15	3143	61 46 58	3145	60 19 43	3146
	Fomalhaut E.	84 03 58	3531	82 44 08	3536	81 24 24	3541	80 04 45	3546
	α Pegasi E.	100 18 07	3242	98 52 47	3243	97 27 29	3242	96 02 10	3242
26	Regulus W.	113 19 00	3096	114 47 15	3095	116 15 31	3094	117 43 48	3093
	Spica W.	59 39 41	3074	61 08 22	3073	62 37 05	3071	64 05 49	3069
	Saturn E.	35 59 32	3135	34 32 05	3138	33 04 42	3142	31 37 23	3146
	α Aquilæ E.	44 25 46	3995	43 14 01	4046	42 03 07	4102	40 53 07	4164
	Jupiter E.	53 03 50	3152	51 36 42	3153	50 09 36	3152	48 42 29	3152
	Fomalhaut E.	73 28 01	3577	72 09 01	3585	70 50 10	3592	69 31 27	3601
	α Pegasi E.	88 55 30	3241	87 30 09	3240	86 04 47	3239	84 39 24	3238
27	Spica W.	71 30 13	3056	72 59 17	3052	74 28 25	3047	75 57 39	3043
	Antares W.	26 54 12	3235	28 19 40	3214	29 45 32	3196	31 11 46	3179
	α Aquilæ E.	35 20 03	4599	34 17 37	4718	33 16 53	4855	32 18 02	5012
	Jupiter E.	41 26 50	3148	39 59 39	3148	38 32 28	3147	37 05 15	3146
	Fomalhaut E.	63 00 26	3653	61 42 49	3666	60 25 25	3680	59 08 17	3696
	Venus E.	76 55 09	3445	75 33 44	3441	74 12 14	3437	72 50 40	3432
	α Pegasi E.	77 32 13	3232	76 06 42	3231	74 41 09	3229	73 15 34	3226
	Sun E.	122 54 30	3424	121 32 41	3420	120 10 47	3415	118 48 47	3409
28	Spica W.	83 25 28	3012	84 55 26	3005	86 25 32	2997	87 55 48	2989
	Antares W.	38 27 39	3107	39 55 40	3093	41 23 58	3081	42 52 31	3068
	Jupiter E.	29 49 04	3147	28 21 51	3148	26 54 40	3151	25 27 32	3155
	Fomalhaut E.	52 47 12	3797	51 32 06	3822	50 17 27	3851	49 03 18	3881
	Venus E.	66 01 18	3402	64 39 04	3395	63 16 42	3387	61 54 11	3379
	α Pegasi E.	66 07 01	3216	64 41 11	3214	63 15 18	3212	61 49 23	3210
	Sun E.	111 57 09	3377	110 34 26	3369	109 11 34	3360	107 48 33	3351
29	Spica W.	95 29 52	2942	97 01 17	2931	98 32 56	2920	100 04 49	2909
	Antares W.	50 19 12	3004	51 49 20	2990	53 19 45	2977	54 50 27	2963
	α Pegasi E.	54 39 16	3204	53 13 11	3204	51 47 06	3204	50 21 01	3205
	Venus E.	54 59 05	3332	53 35 30	3321	52 11 43	3310	50 47 43	3298
	Sun E.	100 50 41	3300	99 26 30	3288	98 02 06	3276	96 37 27	3264
30	Spica W.	107 48 07	2845	109 21 37	2831	110 55 24	2817	112 29 30	2802
	Antares W.	62 28 20	2891	64 00 50	2876	65 33 39	2861	67 06 48	2845
	α Pegasi E.	43 11 28	3231	41 45 55	3241	40 20 33	3254	38 55 26	3270
	Venus E.	43 44 11	3236	42 18 44	3221	40 53 00	3207	39 26 59	3193
	Sun E.	89 30 20	3194	88 04 05	3179	86 37 31	3164	85 10 39	3148

MAY, 1902.

AT GREENWICH APPARENT NOON.

THE SUN'S

Day of the Week	Day of the Month	Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h. m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	2 31 00.58	+ 9.528	N.14 52 24.0	+ 45.78	15 53.28	65.92	2 53.92	0.328
Frid.	2	2 34 49.53	9.551	15 10 35.4	45.16	15 53.04	66.00	3 01.51	0.305
Sat.	3	2 38 39.03	9.574	15 28 31.8	44.54	15 52.81	66.09	3 08.55	0.282
SUN.	4	2 42 29.10	+ 9.598	15 46 13.1	+ 43.90	15 52.58	66.17	3 15.02	0.258
Mon.	5	2 46 19.74	9.622	16 03 38.8	43.24	15 52.35	66.25	3 20.91	0.234
Tues.	6	2 50 10.95	9.646	16 20 48.5	42.57	15 52.13	66.33	3 26.23	0.210
Wed.	7	2 54 02.74	+ 9.669	16 37 41.9	+ 41.88	15 51.90	66.41	3 30.99	0.186
Thur.	8	2 57 55.10	9.693	16 54 18.9	41.18	15 51.68	66.49	3 35.17	0.163
Frid.	9	3 01 48.02	9.716	17 10 38.9	40.48	15 51.46	66.57	3 38.80	0.139
Sat.	10	3 05 41.51	+ 9.740	17 26 41.7	+ 39.76	15 51.24	66.65	3 41.85	0.116
SUN.	11	3 09 35.56	9.763	17 42 27.2	39.02	15 51.02	66.74	3 44.36	0.092
Mon.	12	3 13 30.17	9.787	17 57 54.7	38.27	15 50.81	66.82	3 46.30	0.069
Tues.	13	3 17 25.34	+ 9.810	18 13 04.2	+ 37.51	15 50.60	66.90	3 47.69	0.046
Wed.	14	3 21 21.06	9.833	18 27 55.2	36.73	15 50.40	66.98	3 48.51	0.023
Thur.	15	3 25 17.34	9.856	18 42 27.7	35.95	15 50.20	67.06	3 48.79	0.000
Frid.	16	3 29 14.16	+ 9.879	18 56 41.1	+ 35.16	15 50.00	67.14	3 48.52	0.023
Sat.	17	3 33 11.54	9.902	19 10 35.3	34.35	15 49.81	67.23	3 47.70	0.046
SUN.	18	3 37 09.46	9.925	19 24 10.0	33.53	15 49.62	67.31	3 46.32	0.069
Mon.	19	3 41 07.94	+ 9.948	19 37 25.0	+ 32.71	15 49.43	67.39	3 44.42	0.092
Tues.	20	3 45 06.96	9.971	19 50 20.0	31.87	15 49.25	67.47	3 41.95	0.114
Wed.	21	3 49 06.53	9.994	20 02 54.8	31.02	15 49.07	67.55	3 38.95	0.137
Thur.	22	3 53 06.64	+ 10.016	20 15 09.0	+ 30.16	15 48.89	67.62	3 35.41	0.159
Frid.	23	3 57 07.28	10.038	20 27 02.6	29.29	15 48.71	67.70	3 31.33	0.181
Sat.	24	4 01 08.46	· 10.060	20 38 35.1	28.40	15 48.54	67.77	3 26.73	0.203
SUN.	25	4 05 10.15	+ 10.081	20 49 46.4	+ 27.51	15 48.37	67.84	3 21.60	0.224
Mon.	26	4 09 12.36	10.102	21 00 36.3	26.61	15 48.21	67.91	3 15.96	0.245
Tues.	27	4 13 15.07	10.123	21 11 04.5	25.71	15 48.05	67.98	3 09.82	0.266
Wed.	28	4 17 18.29	+ 10.144	21 21 10.7	+ 24.79	15 47.90	68.04	3 03.17	0.287
Thur.	29	4 21 22.00	10.164	21 30 54.9	23.87	15 47.74	68.11	2 56.05	0.307
Frid.	30	4 25 26.19	10.183	21 40 16.8	22.94	15 47.59	68.17	2 48.43	0.327
Sat.	31	4 29 30.85	10.202	21 49 16.2	22.00	15 47.44	68.23	2 40.36	0.346
SUN.	32	4 33 35.96	+ 10.222	N.21 57 52.9	+ 21.05	15 47.30	68.29	2 31.84	0.364

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting 0.19ˢ from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

		AT GREENWICH MEAN NOON.							
		THE SUN'S							Sidereal Time, or Right Ascension of Mean Sun.
Day of the Week.	Day of the Month.	Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.		
		h m s	s	° ' "	"	m s	s		h m s
Thur.	1	2 31 01.04	+ 9.529	N.14 52 26.2	+ 45.78	2 53.94	+ 0.328		2 33 54.98
Frid.	2	2 34 50.01	9.552	15 10 37.7	45.16	3 01.53	0.305		2 37 51.54
Sat.	3	2 38 39.53	9.575	15 28 34.2	44.54	3 08.56	0.282		2 41 48.09
SUN.	4	2 42 29.62	+ 9.599	15 46 15.5	+ 43.90	3 15.03	+ 0.258		2 45 44.65
Mon.	5	2 46 20.28	9.623	16 03 41.2	43.24	3 20.92	0.234		2 49 41.20
Tues.	6	2 50 11.51	9.647	16 20 50.9	42.57	3 26.24	0.210		2 53 37.75
Wed.	7	2 54 03.31	+ 9.670	16 37 44.4	+ 41.88	3 31.00	+ 0.186		2 57 34.31
Thur.	8	2 57 55.68	9.694	16 54 21.4	41.18	3 35.18	0.163		3 01 30.86
Frid.	9	3 01 48.61	9.717	17 10 41.4	40.48	3 38.81	0.139		3 05 27.42
Sat.	10	3 05 42.11	+ 9.741	17 26 44.2	+ 39.76	3 41.86	+ 0.116		3 09 23.97
SUN.	11	3 09 36.16	9.764	17 42 29.6	39.02	3 44.37	0.092		3 13 20.53
Mon.	12	3 13 30.78	9.787	17 57 57.1	38.27	3 46.30	0.069		3 17 17.08
Tues.	13	3 17 25.95	+ 9.810	18 13 06.5	+ 37.51	3 47.69	+ 0.046		3 21 13.64
Wed.	14	3 21 21.68	9.833	18 27 57.5	36.73	3 48.51	+ 0.023		3 25 10.19
Thur.	15	3 25 17.96	9.856	18 42 29.9	35.95	3 48.79	0.000		3 29 06.75
Frid.	16	3 29 14.78	+ 9.879	18 56 43.3	+ 35.16	3 48.52	− 0.023		3 33 03.30
Sat.	17	3 33 12.16	9.902	19 10 37.4	34.35	3 47.70	0.046		3 36 59.86
SUN.	18	3 37 10.09	9.925	19 24 12.1	33.53	3 46.32	0.069		3 40 56.41
Mon.	19	3 41 08.56	+ 9.948	19 37 27.0	+ 32.71	3 44.41	− 0.092		3 44 52.97
Tues.	20	3 45 07.58	9.971	19 50 22.0	31.87	3 41.94	0.114		3 48 49.52
Wed.	21	3 49 07.14	9.993	20 02 56.7	31.02	3 38.94	0.137		3 52 46.08
Thur.	22	3 53 07.24	+ 10.015	20 15 10.8	+ 30.16	3 35.40	− 0.159		3 56 42.64
Frid.	23	3 57 07.87	10.037	20 27 04.3	29.29	3 31.32	0.181		4 00 39.19
Sat.	24	4 01 09.03	10.059	20 38 36.7	28.40	3 26.72	0.203		4 04 35.75
SUN.	25	4 05 10.71	+ 10.081	20 49 47.9	+ 27.51	3 21.59	− 0.224		4 08 32.30
Mon.	26	4 09 12.91	10.102	21 00 37.7	26.61	3 15.95	0.245		4 12 28.86
Tues.	27	4 13 15.61	10.123	21 11 05.8	25.71	3 09.81	0.266		4 16 25.42
Wed.	28	4 17 18.81	+ 10.144	21 21 12.0	+ 24.79	3 03.16	− 0.287		4 20 21.97
Thur.	29	4 21 22.50	10.164	21 30 56.1	23.87	2 56.03	0.307		4 24 18.53
Frid.	30	4 25 26.67	10.183	21 40 17.9	22.94	2 48.41	0.327		4 28 15.08
Sat.	31	4 29 31.30	10.202	21 49 17.2	22.00	2 40.34	0.346		4 32 11.64
SUN.	32	4 33 36.38	+ 10.220	N.21 57 53.8	+ 21.05	2 31.82	− 0.364		4 36 08.20

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour, + 9.8565ˢ. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ'	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ' "	' "	"	"			h m s
1	121	40 10 26.8	10 01.5	145.53	+ 0.55	0.003 4115	+ 46.4	21 22 34.32
2	122	41 08 38.8	08 13.4	145.47	0.51	0.003 5223	45.9	21 18 38.41
3	123	42 06 49.4	06 23.9	145.41	0.42	0.003 6319	45.4	21 14 42.51
4	124	43 04 58.5	04 32.9	145.35	+ 0.31	0.003 7401	+ 44.8	21 10 46.60
5	125	44 03 06.2	02 40.4	145.29	0.22	0.003 8467	44.1	21 06 50.69
6	126	45 01 12.4	00 46.5	145.23	+ 0.08	0.003 9516	43.3	21 02 54.78
7	127	45 59 17.0	58 51.0	145.16	− 0.07	0.004 0546	+ 42.5	20 58 58.87
8	128	46 57 20.1	56 53.9	145.09	0.20	0.004 1558	41.7	20 55 02.96
9	129	47 55 21.4	54 55.2	145.02	0.31	0.004 2550	40.9	20 51 07.06
10	130	48 53 21.1	52 54.7	144.95	− 0.42	0.004 3523	+ 40.1	20 47 11.15
11	131	49 51 19.0	50 52.4	144.88	0.49	0.004 4478	39.4	20 43 15.24
12	132	50 49 15.0	48 48.4	144.80	0.55	0.004 5415	38.7	20 39 19.33
13	133	51 47 09.3	46 42.5	144.73	− 0.56	0.004 6335	+ 38.0	20 35 23.42
14	134	52 45 01.8	44 34.9	144.65	0.54	0.004 7241	37.4	20 31 27.51
15	135	53 42 52.5	42 25.5	144.58	0.50	0.004 8132	36.9	20 27 31.60
16	136	54 40 41.5	40 14.3	144.51	− 0.42	0.004 9010	+ 36.3	20 23 35.69
17	137	55 38 28.8	38 01.4	144.44	0.31	0.004 9876	35.8	20 19 39.78
18	138	56 36 14.4	35 47.0	144.37	0.20	0.005 0731	35.3	20 15 43.87
19	139	57 33 58.5	33 30.9	144.30	− 0.07	0.005 1575	+ 34.9	20 11 47.96
20	140	58 31 41.1	31 13.3	144.24	+ 0.07	0.005 2408	34.5	20 07 52.05
21	141	59 29 22.2	28 54.3	144.18	0.20	0.005 3231	34.1	20 03 56.14
22	142	60 27 02.0	26 34.0	144.13	+ 0.33	0.005 4044	+ 33.7	20 00 00.23
23	143	61 24 40.5	24 12.4	144.08	0.45	0.005 4846	33.2	19 56 04.32
24	144	62 22 17.8	21 49.5	144.03	0.54	0.005 5636	32.7	19 52 08.41
25	145	63 19 54.0	19 25.5	143.98	+ 0.61	0.005 6416	+ 32.2	19 48 12.50
26	146	64 17 29.1	17 00.5	143.94	0.66	0.005 7184	31.7	19 44 16.59
27	147	65 15 03.2	14 34.4	143.90	0.67	0.005 7938	31.2	19 40 20.68
28	148	66 12 36.4	12 07.4	143.86	+ 0.67	0.005 8680	+ 30.6	19 36 24.77
29	149	67 10 08.6	09 39.6	143.82	0.63	0.005 9406	29.9	19 32 28.86
30	150	68 07 40.1	07 10.9	143.79	0.56	0.006 0116	29.2	19 28 32.95
31	151	69 05 10.8	04 41.4	143.76	0.47	0.006 0810	28.5	19 24 37.04
32	152	70 02 40.7	02 11.2	143.74	+ 0.36	0.006 1484	+ 27.7	19 20 41.13

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' to the mean equinox of January 0.0ᵈ of the Besselian fictitious year.

Diff. for 1 Hour,
− 9.8296ˢ.
(Table II.)

	GREENWICH MEAN TIME.								
	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
Day of the Month.	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 17.0	15 23.5	55 59.6	+ 1.91	56 23.5	+ 2.06	19 11.9	+ 1.97	22.9
2	15 30.5	15 37.8	56 49.0	2.18	57 16.0	2.29	19 59.7	2.01	23.9
3	15 45.4	15 53.2	57 43.9	2.36	58 12.4	2.38	20 48.7	2.09	24.9
4	16 00.9	16 08.5	58 40.8	+ 2.35	59 08.5	+ 2.26	21 40.0	+ 2.19	25.9
5	16 15.7	16 22.3	59 34.8	2.11	59 59.2	1.92	22 33.9	2.32	26.9
6	16 28.2	16 33.2	60 20.8	1.66	60 39.0	1.36	23 31.1	2.44	27.9
7	16 37.1	16 39.8	60 53.4	+ 1.01	61 03.3	+ 0.63	☾		28.9
8	16 41.2	16 41.4	61 08.6	+ 0.24	61 09.1	− 0.15	0 31.2	+ 2.55	0.6
9	16 40.2	16 37.9	61 05.0	− 0.53	60 56.4	0.89	1 33.2	2.60	1.6
10	16 34.4	16 30.0	60 43.7	− 1.22	60 27.4	− 1.48	2 35.3	+ 2.56	2.6
11	16 24.7	16 18.9	60 08.2	1.70	59 46.5	1.87	3 35.8	2.46	3.6
12	16 12.5	16 05.8	59 23.2	1.99	58 58.7	2.07	4 33.3	2.32	4.6
13	15 59.0	15 52.1	58 33.6	− 2.09	58 08.5	− 2.08	5 27.2	+ 2.18	5.6
14	15 45.4	15 38.8	57 43.7	2.03	57 19.7	1.96	6 17.8	2.05	6.6
15	15 32.6	15 26.6	56 56.6	1.87	56 34.7	1.76	7 05.6	1.95	7.6
16	15 21.0	15 15.8	56 14.2	− 1.65	55 55.2	− 1.52	7 51.5	+ 1.89	8.6
17	15 11.0	15 06.7	55 37.7	1.40	55 21.7	1.26	8 36.3	1.86	9.6
18	15 02.7	14 59.2	55 07.2	1.16	54 54.2	1.03	9 20.8	1.86	10.6
19	14 56.0	14 53.3	54 42.6	− 0.89	54 32.5	− 0.78	10 05.6	+ 1.88	11.6
20	14 50.9	14 48.8	54 23.7	0.68	54 16.2	0.58	10 51.0	1.91	12.6
21	14 47.2	14 45.8	54 10.1	0.46	54 05.2	0.35	11 37.3	1.94	13.6
22	14 44.8	14 44.2	54 01.5	− 0.25	53 59.2	− 0.13	12 24.4	+ 1.97	14.6
23	14 43.9	14 44.0	53 58.3	− 0.02	53 58.6	+ 0.09	13 12.1	1.99	15.6
24	14 44.6	14 45.5	54 00.5	+ 0.22	54 03.8	0.35	13 59.8	1.99	16.6
25	14 46.8	14 48.6	54 08.8	+ 0.48	54 15.4	+ 0.63	14 47.3	+ 1.97	17.6
26	14 50.9	14 53.7	54 23.8	0.78	54 34.1	0.93	15 34.3	1.95	18.6
27	14 57.0	15 00.9	54 46.3	1.10	55 00.5	1.27	16 20.7	1.93	19.6
28	15 05.3	15 10.3	55 16.7	+ 1.43	55 34.9	+ 1.58	17 06.7	+ 1.92	20.6
29	15 15.8	15 21.8	55 55.1	1.76	56 17.2	1.91	17 52.9	1.94	21.6
30	15 28.3	15 35.3	56 41.1	2.05	57 06.5	2.18	18 39.8	1.99	22.6
31	15 42.5	15 50.1	57 33.3	+ 2.27	58 00.8	+ 2.33	19 28.3	+ 2.07	23.6
32	15 57.7	16 05.4	58 28.9	+ 2.34	58 56.9	+ 2.33	20 19.3	+ 2.19	24.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 1.					**SATURDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 09 23.54	+ 2.0586	S. 10 57 54.4	+ 8.681	0	22 49 17.59	+ 2.1197	S. 3 00 14.5	+ 10.978
1	21 11 27.07	2.0590	10 49 11.7	8.742	1	22 51 24.84	2.1220	2 49 14.9	11.009
2	21 13 30.62	2.0594	10 40 25.4	8.802	2	22 53 32.23	2.1244	2 38 13.4	11.039
3	21 15 34.20	2.0598	10 31 35.4	8.863	3	22 55 39.77	2.1268	2 27 10.2	11.067
4	21 17 37.80	2.0602	10 22 41.8	8.923	4	22 57 47.45	2.1293	2 16 05.3	11.096
5	21 19 41.43	2.0608	10 13 44.6	8.983	5	22 59 55.29	2.1319	2 04 58.7	11.123
6	21 21 45.10	2.0614	10 04 43.8	9.042	6	23 02 03.28	2.1345	1 53 50.5	11.149
7	21 23 48.80	2.0619	9 55 39.5	9.101	7	23 04 11.43	2.1371	1 42 40.8	11.175
·8	21 25 52.53	2.0625	9 46 31.7	9.158	8	23 06 19.73	2.1397	1 31 29.5	11.200
9	21 27 56.30	2.0632	9 37 20.5	9.216	9	23 08 28.20	2.1425	1 20 16.8	11.222
10	21 30 00.11	2.0638	9 28 05.8	9.273	10	23 10 36.83	2.1452	1 09 02.8	11.245
11	21 32 03.96	2.0645	9 18 47.7	9.330	11	23 12 45.63	2.1481	0 57 47.4	11.267
12	21 34 07.85	2.0652	9 09 26.2	9.386	12	23 ·14 54.60	2.1509	0 46 30.7	11.288
13	21 36 11.79	2.0661	9 00 01.4	9.441	13	23 17 03.74	2.1538	0 35 12.8	11.308
14	21 38 15.78	2.0669	8 50 33.3	9.496	14	23 19 13.06	2.1568	0 23 53.7	11.327
15	21 40 19.82	2.0678	8 41 01.9	9.551	15	23 21 22.56	2.1598	0 12 33.6	11.344
16	21 42 23.92	2.0687	8 31 27.2	9.605	16	23 23 32.24	2.1629	S. 0 01 12.4	11.362
17	21 44 28.07	2.0697	8 21 49.3	9.657	17	23 25 42.11	2.1661	N. 0 10 09.8	11.377
18	21 46 32.28	2.0707	8 12 08.3	9.710	18	23 27 52.17	2.1692	0 21 32.9	11.392
19	21 48 36.55	2.0717	8 02 24.1	9.762	19	23 30 02.42	2.1724	0 32 56.8	11.406
20	21 50 40.88	2.0727	7 52 36.9	9.812	20	23 32 12.86	2.1756	0 44 21.6	11.419
21	21 52 45.27	2.0737	7 42 46.6	9.863	21	23 34 23.49	2.1789	0 55 47.1	11.430
22	21 54 49.73	2.0749	7 32 53.3	9.913	22	23 36 34.33	2.1823	1 07 13.2	11.441
23	21 56 54.26	+ 2.0761	S. 7 22 57.0	+ 9.963	23	23 38 45.37	+ 2.1857	N. 1 18 40.0	+ 11.451
	FRIDAY 2.					**SUNDAY 4.**			
0	21 58 58.86	+ 2.0773	S. 7 12 57.7	+ 10.012	0	23 40 56.61	+ 2.1891	N. 1 30 07.3	+ 11.459
1	22 01 03.54	2.0786	7 02 55.5	10.060	1	23 43 08.06	2.1926	1 41 35.1	11.467
2	22 03 08.29	2.0798	6 52 50.5	10.107	2	23 45 19.72	2.1962	1 53 03.3	11.473
3	22 05 13.12	2.0812	6 42 42.6	10.155	3	23 47 31.60	2.1997	2 04 31.9	11.478
4	22 07 18.04	2.0827	6 32 31.9	10.201	4	23 49 43.69	2.2033	2 16 00.7	11.482
5	22 09 23.04	2.0840	6 22 18.5	10.247	5	23 51 56.00	2.2070	2 27 29.7	11.485
6	22 11 28.12	2.0855	6 12 02.3	10.292	6	23 54 08.53	2.2108	2 38 58.9	11.487
7	22 13 33.30	2.0871	6 01 43.5	10.336	7	23 56 21.29	2.2145	2 50 28.2	11.487
8	22 15 38.57	2.0886	5 51 22.0	10.380	8	23 58 34.27	2.2183	3 01 57.4	11.487
9	22 17 43.93	2.0902	5 40 57.9	10.423	9	0 00 47.49	2.2222	3 13 26.6	11.485
10	22 19 49.39	2.0918	5 30 31.2	10.465	10	0 03 00.94	2.2261	3 24 55.6	11.482
11	22 21 54.95	2.0935	5 20 02.1	10.506	11	0 05 14.62	2.2299	3 36 24.4	11.477
12	22 24 00.61	2.0952	5 09 30.5	10.547	12	0 07 28.53	2.2339	3 47 52.9	11.472
13	22 26 06.38	2.0970	4 58 56.5	10.587	13	0 09 42.69	2.2380	3 59 21.1	11.466
14	22 28 12.25	2.0988	4 48 20.1	10.627	14	0 11 57.09	2.2420	4 10 48.8	11.457
15	22 30 18.24	2.1007	4 37 41.3	10.666	15	0 14 11.73	2.2461	4 22 16.0	11.448
16	22 32 24.34	2.1027	4 27 00.2	10.703	16	0 16 26.62	2.2502	4 33 42.6	11.438
17	22 34 30.56	2.1047	4 16 16.9	10.740	17	0 18 41.76	2.2544	4 45 08.6	11.427
18	22 36 36.90	2.1067	4 05 31.4	10.777	18	0 20 57.15	2.2587	4 56 33.8	11.413
19	22 38 43.36	2.1087	3 54 43.7	10.812	19	0 23 12.80	2.2630	5 07 58.2	11.399
20	22 40 49.95	2.1108	3 43 53.9	10.847	20	0 25 28.71	2.2673	5 19 21.7	11.383
21	22 42 56.66	2.1129	3 33 02.0	10.882	21	0 27 44.87	2.2716	5 30 44.2	11.366
22	22 45 03.50	2.1152	3 22 08.1	10.914	22	0 30 01.30	2.2760	5 42 05.6	11.347
23	22 47 10.48	2.1174	3 11 12.3	10.947	23	0 32 17.99	2.2803	5 53 25.9	11.328
24	22 49 17.59	+ 2.1197	S. 3 00 14.5	+ 10.978	24	0 34 34.94	+ 2.2847	N. 6 04 45.0	+ 11.307

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 5. / WEDNESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ' "	."		h m s	s	° ' "	"
0	0 34 34.94	+ 2.2847	N. 6 04 45.0	+11.307	0	2 29 47.06	+ 2.5169	N.14 15 26.4	+8.554
1	0 36 52.16	2.2892	6 16 02.8	11.285	1	2 32 18.22	2.5216	14 23 56.8	8.459
2	0 39 09.65	2.2938	6 27 19.2	11.261	2	2 34 49.65	2.5261	14 32 21.5	8.362
3	0 41 27.42	2.2984	6 38 34.1	11.235	3	2 37 21.35	2.5306	14 40 40.3	8.264
4	0 43 45.46	2.3029	6 49 47.4	11.208	4	2 39 53.32	2.5351	14 48 53.2	8.166
5	0 46 03.77	2.3075	7 00 59.1	11.181	5	2 42 25.56	2.5395	14 57 00.2	8.066
6	0 48 22.36	2.3122	7 12 09.1	11.152	6	2 44 58.06	2.5438	15 05 01.1	7.963
7	0 50 41.23	2.3168	7 23 17.3	11.120	7	2 47 30.82	2.5482	15 12 55.8	7.860
8	0 53 00.38	2.3216	7 34 23.5	11.087	8	2 50 03.84	2.5524	15 20 44.3	7.755
9	0 55 19.82	2.3263	7 45 27.8	11.055	9	2 52 37.11	2.5567	15 28 26.4	7.648
10	0 57 39.54	2.3310	7 56 30.1	11.020	10	2 55 10.64	2.5608	15 36 02.1	7.542
11	0 59 59.54	2.3357	8 07 30.2	10.982	11	2 57 44.41	2.5648	15 43 31.4	7.433
12	1 02 19.83	2.3406	8 18 28.0	10.944	12	3 00 18.42	2.5689	15 50 54.1	7.322
13	1 04 40.41	2.3454	8 29 23.5	10.905	13	3 02 52.68	2.5729	15 58 10.1	7.211
14	1 07 01.28	2.3502	8 40 16.6	10.864	14	3 05 27.17	2.5767	16 05 19.4	7.098
15	1 09 22.44	2.3551	8 51 07.2	10.821	15	3 08 01.89	2.5806	16 12 21.9	6.984
16	1 11 43.89	2.3600	9 01 55.1	10.777	16	3 10 36.84	2.5843	16 19 17.5	6.869
17	1 14 05.64	2.3649	9 12 40.4	10.732	17	3 13 12.01	2.5880	16 26 06.2	6.752
18	1 16 27.68	2.3698	9 23 22.9	10.684	18	3 15 47.40	2.5917	16 32 47.8	6.634
19	1 18 50.02	2.3747	9 34 02.5	10.636	19	3 18 23.01	2.5952	16 39 22.3	6.516
20	1 21 12.65	2.3797	9 44 39.2	10.586	20	3 20 58.82	2.5986	16 45 49.7	6.396
21	1 23 35.58	2.3846	9 55 12.8	10.534	21	3 23 34.84	2.6020	16 52 09.8	6.274
22	1 25 58.80	2.3896	10 05 43.3	10.481	22	3 26 11.06	2.6052	16 58 22.6	6.152
23	1 28 22.33	+ 2.3946	N.10 16 10.5	+ 10.426	23	3 28 47.47	+ 2.6084	N.17 04 28.1	+ 6.029

TUESDAY 6. / THURSDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 30 46.15	+ 2.3995	N.10 26 34.4	+ 10.370	0	3 31 24.07	+ 2.6116	N.17 10 26.1	+ 5.903
1	1 33 10.27	2.4046	10 36 54.9	10.312	1	3 34 00.86	2.6146	17 16 16.5	5.778
2	1 35 34.70	2.4096	10 47 11.9	10.252	2	3 36 37.82	2.6175	17 21 59.4	5.652
3	1 37 59.42	2.4145	10 57 25.2	10.191	3	3 39 14.96	2.6204	17 27 34.7	5.523
4	1 40 24.44	2.4195	11 07 34.8	10.128	4	3 41 52.27	2.6232	17 33 02.2	5.394
5	1 42 49.76	2.4245	11 17 40.6	10.065	5	3 44 29.74	2.6257	17 38 22.0	5.265
6	1 45 15.38	2.4295	11 27 42.6	10.000	6	3 47 07.36	2.6282	17 43 34.0	5.134
7	1 47 41.30	2.4345	11 37 40.6	9.932	7	3 49 45.13	2.6307	17 48 38.1	5.003
8	1 50 07.52	2.4395	11 47 34.5	9.863	8	3 52 23.05	2.6332	17 53 34.3	4.871
9	1 52 34.04	2.4445	11 57 24.2	9.793	9	3 55 01.11	2.6354	17 58 22.6	4.737
10	1 55 00.86	2.4494	12 07 09.7	9.722	10	3 57 39.30	2.6375	18 03 02.8	4.603
11	1 57 27.97	2.4543	12 16 50.8	9.647	11	4 00 17.61	2.6395	18 07 35.0	4.469
12	1 59 55.38	2.4593	12 26 27.4	9.572	12	4 02 56.04	2.6415	18 11 59.1	4.333
13	2 02 23.09	2.4642	12 35 59.5	9.497	13	4 05 34.59	2.6433	18 16 15.0	4.197
14	2 04 51.09	2.4692	12 45 27.0	9.418	14	4 08 13.24	2.6450	18 20 22.7	4.060
15	2 07 19.39	2.4741	12 54 49.7	9.338	15	4 10 51.99	2.6466	18 24 22.2	3.922
16	2 09 47.98	2.4789	13 04 07.6	9.257	16	4 13 30.83	2.6481	18 28 13.4	3.784
17	2 12 16.86	2.4837	13 13 20.6	9.175	17	4 16 09.76	2.6495	18 31 56.3	3.645
18	2 14 46.03	2.4886	13 22 28.6	9.091	18	4 18 48.77	2.6507	18 35 30.8	3.506
19	2 17 15.49	2.4934	13 31 31.5	9.005	19	4 21 27.85	2.6519	18 38 57.0	3.367
20	2 19 45.24	2.4982	13 40 29.2	8.917	20	4 24 07.00	2.6530	18 42 14.8	3.226
21	2 22 15.27	2.5029	13 49 21.6	8.829	21	4 26 46.21	2.6539	18 45 24.1	3.085
22	2 24 45.59	2.5077	13 58 08.7	8.739	22	4 29 25.47	2.6547	18 48 25.0	2.944
23	2 27 16.19	2.5123	14 06 50.3	8.647	23	4 32 04.77	2.6553	18 51 17.4	2.802
24	2 29 47.06	+ 2.5169	N.14 15 26.4	+ 8.554	24	4 34 44.11	+ 2.6559	N.18 54 01.2	+ 2.659

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 9.					**SUNDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 34 44.11	+ 2.6559	N.18 54 01.2	+ 2.659	0	6 40 38.34	+ 2.5487	N.18 18 48.8	− 3.964
1	4 37 23.48	2.6563	18 56 36.5	2.517	1	6 43 11.13	2.5442	18 14 47.3	4.086
2	4 40 02.87	2.6567	18 59 03.2	2.374	2	6 45 43.64	2.5396	18 10 38.5	4.207
3	4 42 42.28	2.6569	19 01 21.4	2.232	3	6 48 15.88	2.5349	18 06 22.4	4.327
4	4 45 21.70	2.6570	19 03 31.0	2.088	4	6 50 47.83	2.5301	18 01 59.2	4.446
5	4 48 01.12	2.6569	19 05 32.0	1.944	5	6 53 19.49	2.5252	17 57 28.9	4.564
6	4 50 40.53	2.6567	19 07 24.3	1.801	6	6 55 50.86	2.5203	17 52 51.5	4.682
7	4 53 19.93	2.6565	19 09 08.1	1.657	7	6 58 21.93	2.5154	17 48 07.1	4.797
8	4 55 59.31	2.6561	19 10 43.2	1.513	8	7 00 52.71	2.5105	17 43 15.8	4.912
9	4 58 38.66	2.6556	19 12 09 7	1.370	9	7 03 23.19	2.5054	17 38 17.7	5.026
10	5 01 17.98	2.6550	19 13 27.6	1.226	10	7 05 53.36	2.5002	17 33 12.7	5.139
11	5 03 57.26	2.6542	19 14 36.8	1.082	11	7 08 23.22	2.4952	17 28 01.0	5.250
12	5 06 36.49	2.6533	19 15 37.4	0.937	12	7 10 52.78	2.4900	17 22 42.7	5.360
13	5 09 15.66	2.6523	19 16 29.3	0.793	13	7 13 22.02	2.4847	17 17 17.8	5.468
14	5 11 54.77	2.6512	19 17 12.6	0.650	14	7 15 50.95	2.4795	17 11 46.5	5.576
15	5 14 33.80	2.6499	19 17 47.3	0.507	15	7 18 19.56	2.4742	17 06 08.7	5.683
16	5 17 12.76	2.6486	19 18 13.4	0.363	16	7 20 47.85	2.4688	17 00 24.5	5.788
17	5 19 51.63	2.6471	19 18 30.9	0.220	17	7 23 15.82	2.4634	16 54 34.1	5.893
18	5 22 30.41	2.6455	19 18 39.8	+ 0.077	18	7 25 43.46	2.4580	16 48 37.4	5.997
19	5 25 09.09	2.6437	19 18 40.1	− 0.066	19	7 28 10.78	2.4526	16 42 34.5	6.098
20	5 27 47.66	2.6419	19 18 31.9	0.208	20	7 30 37.77	2.4472	16 36 25.6	6.198
21	5 30 26.12	2.6400	19 18 15.1	0.351	21	7 33 04.44	2.4417	16 30 10.7	6.298
22	5 33 04.46	2.6380	19 17 49.8	0.492	22	7 35 30.77	2.4361	16 23 49.8	6.397
23	5 35 42.68	+ 2.6358	N.19 17 16.0	− 0.634	23	7 37 56.77	+ 2.4306	N.16 17 23.0	− 6.494
	SATURDAY 10.					**MONDAY 12.**			
0	5 38 20.76	+ 2.6335	N.19 16 33.7	− 0.775	0	7 40 22.44	+ 2.4251	N.16 10 50.5	− 6.589
1	5 40 58.70	2.6311	19 15 43.0	0.916	1	7 42 47.78	2.4195	16 04 12.3	6.684
2	5 43 36.49	2.6285	19 14 43.8	1.056	2	7 45 12.78	2.4139	15 57 28.4	6.777
3	5 46 14.12	2.6259	19 13 36.3	1.195	3	7 47 37.45	2.4083	15 50 39.0	6.869
4	5 48 51.60	2.6232	19 12 20.4	1.334	4	7 50 01.78	2.4027	15 43 44.1	6.960
5	5 51 28.91	2.6203	19 10 56.2	1.472	5	7 52 25.77	2.3970	15 36 43.8	7.050
6	5 54 06.04	2.6174	19 09 23.7	1.611	6	7 54 49.42	2.3914	15 29 38.1	7.138
7	5 56 43.00	2.6144	19 07 42.9	1.748	7	7 57 12.74	2.3858	15 22 27.2	7.225
8	5 59 19.77	2.6113	19 05 53.9	1.885	8	7 59 35.72	2.3802	15 15 11.1	7.311
9	6 01 56.35	2.6081	19 03 56.7	2.021	9	8 01 58.36	2.3745	15 07 49.9	7.396
10	6 04 32.74	2.6047	19 01 51.4	2.156	10	8 04 20.66	2.3688	15 00 23.6	7.479
11	6 07 08.92	2.6012	18 59 38.0	2.291	11	8 06 42.62	2.3632	14 52 52.4	7.561
12	6 09 44.89	2.5977	18 57 16.5	2.425	12	8 09 04.25	2.3577	14 45 16.3	7.642
13	6 12 20.65	2.5941	18 54 47.0	2.557	13	8 11 25.54	2.3520	14 37 35.4	7.722
14	6 14 56.18	2.5903	18 52 09.6	2.689	14	8 13 46.49	2.3463	14 29 49.7	7.800
15	6 17 31.49	2.5866	18 49 24.3	2.821	15	8 16 07.10	2.3407	14 21 59.4	7.877
16	6 20 06.57	2.5827	18 46 31.1	2.952	16	8 18 27.37	2.3351	14 14 04.5	7.953
17	6 22 41.42	2.5788	18 43 30.1	3.082	17	8 20 47.31	2.3295	14 06 05.0	8.028
18	6 25 16.03	2.5747	18 40 21.3	3.211	18	8 23 06.92	2.3240	13 58 01.1	8.101
19	6 27 50.39	2.5706	18 37 04.8	3.338	19	8 25 26.19	2.3184	13 49 52.9	8.173
20	6 30 24.50	2.5663	18 33 40.7	3.465	20	8 27 45.13	2.3128	13 41 40.3	8.245
21	6 32 58.35	2.5621	18 30 09.0	3.591	21	8 30 03.73	2.3072	13 33 23.5	8.314
22	6 35 31.95	2.5577	18 26 29.8	3.717	22	8 32 22.00	2.3018	13 25 02.6	8.382
23	6 38 05.28	2.5532	18 22 43.0	3.842	23	8 34 39.95	2.2963	13 16 37.6	8.450
24	6 40 38.34	+ 2.5487	N.18 18 48.8	− 3.964	24	8 36 57.56	+ 2.2908	N.13 08 08.6	− 8.516

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 13.					**THURSDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 36 57.56	+ 2.2908	N.13 08 08.6	− 8.516	0	10 21 16.38	+ 2.0725	N. 5 24 40.9	−10.392
1	8 39 14.85	2.2854	12 59 35.7	8.581	1	10 23 20.63	2.0691	5 14 16.9	10.407
2	8 41 31.81	2.2800	12 50 58.9	8.645	2	10 25 24.67	2.0657	5 03 52.0	10.422
3	8 43 48.45	2.2746	12 42 18.3	8.707	3	10 27 28.52	2.0625	4 53 26.3	10.435
4	8 46 04.76	2.2692	12 33 34.0	8.768	4	10 29 32.17	2.0592	4 42 59.8	10.447
5	8 48 20.75	2.2638	12 24 46.1	8.828	5	10 31 35.63	2.0562	4 32 32.6	10.458
6	8 50 36.42	2.2585	12 15 54.6	8.887	6	10 33 38.91	2.0531	4 22 04.8	10.469
7	8 52 51.77	2.2532	12 06 59.6	8.946	7	10 35 42.00	2.0500	4 11 36.3	10.479
8	8 55 06.81	2.2480	11 58 01.1	9.003	8	10 37 44.91	2.0470	4 01 07.3	10.487
9	8 57 21.53	2.2427	11 48 59.2	9.058	9	10 39 47.64	2.0441	3 50 37.8	10.496
10	8 59 35.94	2.2376	11 39 54.1	9.112	10	10 41 50.20	2.0412	3 40 07.8	10.503
11	9 01 50.04	2.2324	11 30 45.8	9.165	11	10 43 52.58	2.0383	3 29 37.4	10.510
12	9 04 03.83	2.2272	11 21 34.3	9.217	12	10 45 54.80	2.0356	3 19 06.6	10.516
13	9 06 17.31	2.2222	11 12 19.7	9.268	13	10 47 56.85	2.0328	3 08 35.5	10.520
14	9 08 30.49	2.2172	11 03 02.1	9.317	14	10 49 58.74	2.0302	2 58 04.2	10.523
15	9 10 43.37	2.2121	10 53 41.6	9.366	15	10 52 00.47	2.0276	2 47 32.7	10.527
16	9 12 55.94	2.2071	10 44 18.2	9.414	16	10 54 02.05	2.0250	2 37 01.0	10.530
17	9 15 08.22	2.2022	10 34 51.9	9.461	17	10 56 03.47	2.0224	2 26 29.1	10.532
18	9 17 20.21	2.1974	10 25 22.9	9.506	18	10 58 04.74	2.0200	2 15 57.2	10.532
19	9 19 31.91	2.1925	10 15 51.2	9.551	19	11 00 05.87	2.0177	2 05 25.2	10.532
20	9 21 43.31	2.1877	10 06 16.8	9.594	20	11 02 06.86	2.0153	1 54 53.3	10.532
21	9 23 54.43	2.1830	9 56 39.9	9.636	21	11 04 07.71	2.0130	1 44 21.4	10.531
22	9 26 05.27	2.1782	9 47 00.5	9.677	22	11 06 08.42	2.0107	1 33 49.6	10.529
23	9 28 15.82	+ 2.1736	N. 9 37 18.7	− 9.717	23	11 08 09.00	+ 2.0086	N. 1 23 17.9	−10.526
	WEDNESDAY 14.					**FRIDAY 16.**			
0	9 30 26.10	+ 2.1690	N. 9 27 34.5	− 9.756	0	11 10 09.45	+ 2.0065	N. 1 12 46.5	−10.522
1	9 32 36.10	2.1643	9 17 48.0	9.793	1	11 12 09.78	2.0044	1 02 15.3	10.517
2	9 34 45.82	2.1597	9 07 59.3	9.830	2	11 14 09.98	2.0023	0 51 44.4	10.512
3	9 36 55.27	2.1552	8 58 08.4	9.867	3	11 16 10.06	2.0003	0 41 13.9	10.506
4	9 39 04.45	2.1508	8 48 15.3	9.902	4	11 18 10.02	1.9984	0 30 43.7	10.500
5	9 41 13.37	2.1465	8 38 20.2	9.935	5	11 20 09.87	1.9966	0 20 13.9	10.492
6	9 43 22.03	2.1422	8 28 23.1	9.967	6	11 22 09.61	1.9947	N. 0 09 44.6	10.484
7	9 45 30.43	2.1378	8 18 24.1	9.999	7	11 24 09.24	1.9930	S. 0 00 44.2	10.476
8	9 47 38.57	2.1335	8 08 23.2	10.030	8	11 26 08.77	1.9913	0 11 12.5	10.467
9	9 49 46.45	2.1293	7 58 20.5	10.060	9	11 28 08.20	1.9897	0 21 40.2	10.456
10	9 51 54.09	2.1252	7 48 16.0	10.089	10	11 30 07.53	1.9881	0 32 07.2	10.445
11	9 54 01.48	2.1211	7 38 09.8	10.117	11	11 32 06.77	1.9865	0 42 33.6	10.434
12	9 56 08.62	2.1170	7 28 02.0	10.143	12	11 34 05.91	1.9849	0 52 59.3	10.422
1	9 58 15.52	2.1131	7 17 52.6	10.169	13	11 36 04.96	1.9835	1 03 24.2	10.408
14	10 00 22.19	2.1092	7 07 41.7	10.194	14	11 38 03.93	1.9821	1 13 48.3	10.394
15	10 02 28.62	2.1052	6 57 29.3	10.218	15	11 40 02.81	1.9807	1 24 11.5	10.380
16	10 04 34.81	2.1013	6 47 15.5	10.242	16	11 42 01.62	1.9795	1 34 33.9	10.366
17	10 06 40.78	2.0976	6 37 00.3	10.263	17	11 44 00.35	1.9782	1 44 55.4	10.350
18	10 08 46.52	2.0937	6 26 43.9	10.284	18	11 45 59.00	1.9769	1 55 15.9	10.333
19	10 10 52.03	2.0901	6 16 26.2	10.305	19	11 47 57.58	1.9758	2 05 35.4	10.316
20	10 12 57.33	2.0865	6 06 07.3	10.324	20	11 49 56.10	1.9747	2 15 53.8	10.298
21	10 15 02.41	2.0829	5 55 47.3	10.343	21	11 51 54.55	1.9737	2 26 11.2	10.280
22	10 17 07.28	2.0793	5 45 26.2	10.361	22	11 53 52.94	1.9727	2 36 27.4	10.261
23	10 19 11.93	2.0758	5 35 04.0	10.377	23	11 55 51.27	1.9717	2 46 42.5	10.241
24	10 21 16.38	+ 2.0725	N. 5 24 40.9	− 10.392	24	11 57 49.54	+ 1.9707	S. 2 56 56.3	− 10.220

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 17. / MONDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 57 49.54	+1.9707	S. 2 56 56.3	−10.220	0	13 32 10.09	+1.9744	S.10 32 04.4	−8.512
1	11 59 47.76	1.9699	3 07 08.9	10.199	1	13 34 08.58	1.9753	10 40 33.6	8.462
2	12 01 45.93	1.9691	3 17 20.2	10.177	2	13 36 07.13	1.9763	10 48 59.8	8.411
3	12 03 44.05	1.9682	3 27 30.2	10.156	3	13 38 05.74	1.9772	10 57 22.9	8.359
4	12 05 42.12	1.9675	3 37 38.9	10.133	4	13 40 04.40	1.9782	11 05 42.9	8.307
5	12 07 40.15	1.9668	3 47 46.2	10.109	5	13 42 03.12	1.9792	11 13 59.8	8.256
6	12 09 38.14	1.9662	3 57 52.0	10.084	6	13 44 01.90	1.9802	11 22 13.6	8.203
7	12 11 36.09	1.9656	4 07 56.3	10.059	7	13 46 00.74	1.9812	11 30 24.2	8.150
8	12 13 34.01	1.9651	4 17 59.1	10.034	8	13 47 59.64	1.9822	11 38 31.6	8.096
9	12 15 31.90	1.9646	4 28 00.4	10.008	9	13 49 58.61	1.9834	11 46 35.7	8.041
10	12 17 29.76	1.9641	4 38 00.1	9.981	10	13 51 57.64	1.9844	11 54 36.5	7.986
11	12 19 27.59	1.9636	4 47 58.1	9.953	11	13 53 56.74	1.9856	12 02 34.0	7.930
12	12 21 25.39	1.9632	4 57 54.5	9.926	12	13 55 55.91	1.9867	12 10 28.1	7.874
13	12 23 23.17	1.9629	5 07 49.2	9.897	13	13 57 55.14	1.9878	12 18 18.9	7.817
14	12 25 20.94	1.9627	5 17 42.1	9.867	14	13 59 54.45	1.9890	12 26 06.2	7.760
15	12 27 18.69	1.9623	5 27 33.2	9.837	15	14 01 53.82	1.9902	12 33 50.1	7.703
16	12 29 16.42	1.9621	5 37 22.5	9.807	16	14 03 53.27	1.9913	12 41 30.6	7.645
17	12 31 14.14	1.9620	5 47 10.0	9.776	17	14 05 52.78	1.9925	12 49 07.5	7.586
18	12 33 11.86	1.9619	5 56 55.6	9.744	18	14 07 52.37	1.9938	12 56 40.9	7.527
19	12 35 09.57	1.9617	6 06 39.3	9.712	19	14 09 52.04	1.9951	13 04 10.7	7.467
20	12 37 07.27	1.9617	6 16 21.0	9.678	20	14 11 51.78	1.9962	13 11 36.9	7.407
21	12 39 04.97	1.9617	6 26 00.7	9.644	21	14 13 51.59	1.9975	13 18 59.5	7.346
22	12 41 02.67	1.9617	6 35 38.3	9.610	22	14 15 51.48	1.9988	13 26 18.4	7.284
23	12 43 00.38	+1.9618	S. 6 45 13.9	−9.575	23	14 17 51.45	+2.0002	S.13 33 33.6	−7.222

SUNDAY 18. / TUESDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 44 58.09	+1.9619	S. 6 54 47.3	−9.539	0	14 19 51.50	+2.0015	S.13 40 45.1	−7.160
1	12 46 55.81	1.9620	7 04 18.6	9.503	1	14 21 51.63	2.0027	13 47 52.8	7.097
2	12 48 53.53	1.9622	7 13 47.7	9.467	2	14 23 51.83	2.0041	13 54 56.7	7.033
3	12 50 51.27	1.9624	7 23 14.6	9.430	3	14 25 52.12	2.0054	14 01 56.8	6.970
4	12 52 49.02	1.9627	7 32 39.3	9.392	4	14 27 52.48	2.0067	14 08 53.1	6.906
5	12 54 46.79	1.9630	7 42 01.6	9.353	5	14 29 52.93	2.0081	14 15 45.5	6.841
6	12 56 44.58	1.9632	7 51 21.6	9.314	6	14 31 53.45	2.0094	14 22 34.0	6.775
7	12 58 42.38	1.9636	8 00 39.3	9.275	7	14 33 54.06	2.0108	14 29 18.5	6.709
8	13 00 40.21	1.9640	8 09 54.6	9.234	8	14 35 54.75	2.0122	14 35 59.1	6.643
9	13 02 38.06	1.9644	8 19 07.4	9.193	9	14 37 55.53	2.0137	14 42 35.7	6.576
10	13 04 35.94	1.9649	8 28 17.8	9.152	10	14 39 56.39	2.0150	14 49 08.2	6.508
11	13 06 33.85	1.9654	8 37 25.7	9.110	11	14 41 57.33	2.0163	14 55 36.7	6.441
12	13 08 31.79	1.9659	8 46 31.0	9.067	12	14 43 58.35	2.0177	15 02 01.1	6.372
13	13 10 29.76	1.9665	8 55 33.8	9.024	13	14 45 59.46	2.0192	15 08 21.4	6.304
14	13 12 27.77	1.9671	9 04 33.9	8.980	14	14 48 00.65	2.0205	15 14 37.6	6.235
15	13 14 25.81	1.9677	9 13 31.4	8.936	15	14 50 01.92	2.0219	15 20 49.6	6.165
16	13 16 23.89	1.9683	9 22 26.2	8.891	16	14 52 03.28	2.0233	15 26 57.4	6.095
17	13 18 22.01	1.9690	9 31 18.3	8.846	17	14 54 04.72	2.0247	15 33 01.0	6.024
18	13 20 20.17	1.9697	9 40 07.7	8.800	18	14 56 06.25	2.0262	15 39 00.3	5.952
19	13 22 18.37	1.9704	9 48 54.3	8.753	19	14 58 07.86	2.0275	15 44 55.3	5.882
20	13 24 16.62	1.9712	9 57 38.1	8.706	20	15 00 09.55	2.0289	15 50 46.1	5.810
21	13 26 14.92	1.9720	10 06 19.0	8.658	21	15 02 11.33	2.0303	15 56 32.5	5.737
22	13 28 13.26	1.9727	10 14 57.1	8.610	22	15 04 13.19	2.0317	16 02 14.6	5.665
23	13 30 11.65	1.9736	10 23 32.2	8.561	23	15 06 15.13	2.0330	16 07 52.3	5.592
24	13 32 10.09	+1.9744	S.10 32 04.4	−8.512	24	15 08 17.15	+2.0344	S.16 13 25.6	−5.517

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 21.					**FRIDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 08 17.15	+ 2.0344	S.16 13 25.6	− 5.517	0	16 47 19.21	+ 2.0852	S.19 06 29.6	− 1.580
1	15 10 19.26	2.0358	16 18 54.4	5.443	1	16 49 24.34	2.0858	19 08 01.8	1.492
2	15 12 21.45	2.0372	16 24 18.8	5.369	2	16 51 29.51	2.0864	19 09 28.7	1.404
3	15 14 23.73	2.0386	16 29 38.7	5.294	3	16 53 34.71	2.0868	19 10 50.3	1.316
4	15 16 26.08	2.0399	16 34 54.1	5.219	4	16 55 39.93	2.0872	19 12 06.6	1.227
5	15 18 28.52	2.0413	16 40 05.0	5.143	5	16 57 45.18	2.0877	19 13 17.6	1.139
6	15 20 31.04	2.0427	16 45 11.3	5.067	6	16 59 50.46	2.0882	19 14 23.3	1.050
7	15 22 33.64	2.0440	16 50 13.1	4.991	7	17 01 55.76	2.0885	19 15 23.6	0.961
8	15 24 36.32	2.0453	16 55 10.2	4.913	8	17 04 01.08	2.0889	19 16 18.6	0.872
9	15 26 39.08	2.0467	17 00 02.7	4.836	9	17 06 06.43	2.0892	19 17 08.3	0.784
10	15 28 41.92	2.0479	17 04 50.5	4.758	10	17 08 11.79	2.0895	19 17 52.7	0.696
11	15 30 44.83	2.0492	17 09 33.7	4.681	11	17 10 17.17	2.0898	19 18 31.8	0.607
12	15 32 47.82	2.0505	17 14 12.2	4.602	12	17 12 22.57	2.0901	19 19 05.5	0.517
13	15 34 50.89	2.0518	17 18 46.0	4.523	13	17 14 27.98	2.0903	19 19 33.9	0.428
14	15 36 54.04	2.0531	17 23 15.0	4.443	14	17 16 33.41	2.0905	19 19 56.9	0.339
15	15 38 57.26	2.0543	17 27 39.2	4.364	15	17 18 38.84	2.0907	19 20 14.6	0.250
16	15 41 00.56	2.0556	17 31 58.7	4.285	16	17 20 44.29	2.0908	19 20 26.9	0.161
17	15 43 03.93	2.0567	17 36 13.4	4.204	17	17 22 49.74	2.0909	19 20 33.9	− 0.072
18	15 45 07.37	2.0579	17 40 23.2	4.123	18	17 24 55.20	2.0910	19 20 35.6	+ 0.017
19	15 47 10.88	2.0592	17 44 28.2	4.043	19	17 27 00.66	2.0910	19 20 31.8	0.107
20	15 49 14.47	2.0604	17 48 28.4	3.962	20	17 29 06.12	2.0911	19 20 22.7	0.196
21	15 51 18.13	2.0616	17 52 23.7	3.881	21	17 31 11.59	2.0912	19 20 08.3	0.285
22	15 53 21.86	2.0627	17 56 14.1	3.799	22	17 33 17.06	2.0911	19 19 48.5	0.375
23	15 55 25.65	+ 2.0637	S.17 59 59.6	− 3.717	23	17 35 22.52	+ 2.0910	S.19 19 23.3	+ 0.464
	THURSDAY 22.					**SATURDAY 24.**			
0	15 57 29.51	+ 2.0649	S.18 03 40.1	− 3.634	0	17 37 27.98	+ 2.0910	S.19 18 52.8	+ 0.553
1	15 59 33.44	2.0660	18 07 15.7	3.552	1	17 39 33.44	2.0909	19 18 16.9	0.642
2	16 01 37.43	2.0671	18 10 46.3	3.468	2	17 41 38.89	2.0907	19 17 35.7	0.731
3	16 03 41.49	2.0682	18 14 11.9	3.385	3	17 43 44.33	2.0906	19 16 49.2	0.820
4	16 05 45.61	2.0692	18 17 32.5	3.301	4	17 45 49.76	2.0904	19 15 57.3	0.909
5	16 07 49.79	2.0702	18 20 48.0	3.217	5	17 47 55.18	2.0902	19 15 00.1	0.998
6	16 09 54.03	2.0712	18 23 58.5	3.133	6	17 50 00.59	2.0900	19 13 57.5	1.087
7	16 11 58.33	2.0722	18 27 04.0	3.049	7	17 52 05.98	2.0897	19 12 49.6	1.176
8	16 14 02.69	2.0732	18 30 04.4	2.964	8	17 54 11.36	2 0895	19 11 36.4	1.265
9	16 16 07.11	2.0741	18 32 59.7	2.879	9	17 56 16.72	2 0892	19 10 17.8	1.353
10	16 18 11.58	2.0749	18 35 49.9	2.793	10	17 58 22.07	2.0889	19 08 54.0	1.442
11	16 20 16.10	2.0758	18 38 34.9	2.708	11	18 00 27.39	2.0885	19 07 24.8	1.531
12	16 22 20.68	2.0767	18 41 14.9	2.623	12	18 02 32.69	2.0881	19 05 50.3	1.619
13	16 24 25.31	2.0776	18 43 49.7	2.537	13	18 04 37.96	2.0877	19 04 10.5	1.707
14	16 26 29.99	2.0784	18 46 19.3	2.451	14	18 06 43.22	2.0874	19 02 25.5	1.794
15	16 28 34.72	2.0792	18 48 43.8	2.365	15	18 08 48.45	2.0869	19 00 35.2	1.882
16	16 30 39.49	2.0799	18 51 03.1	2.278	16	18 10 53.65	2.0864	18 58 39.6	1.971
17	16 32 44.31	2.0807	18 53 17.2	2.192	17	18 12 58.82	2.0859	18 56 38.7	2.058
18	16 34 49.17	2.0814	18 55 26.1	2.105	18	18 15 03.96	2.0854	18 54 32.6	2.146
19	16 36 54.08	2.0822	18 57 29.8	2.018	19	18 17 09.07	2.0849	18 52 21.2	2.233
20	16 38 59.03	2.0828	18 59 28.3	1.931	20	18 19 14.15	2.0843	18 50 04.6	2.320
21	16 41 04.02	2.0835	19 01 21.5	1.843	21	18 21 19.19	2.0837	18 47 42.8	2.407
22	16 43 09.05	2.0841	19 03 09.5	1.756	22	18 23 24.20	2.0832	18 45 15.7	2.495
23	16 45 14.11	2.0847	19 04 52.2	1.667	23	18 25 29.17	2.0826	18 42 43.4	2.581
24	16 47 19.21	+ 2.0852	S.19 06 29.6	− 1.580	24	18 27 34.11	+ 2.0820	S.18 40 06.0	+ 2.667

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 25.					**TUESDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 27 34.11	+ 2.0820	S.18 40 06.0	+ 2.667	0	20 06 32.97	+ 2.0404	S.14 57 10.9	+ 6.501
1	18 29 39.01	2.0813	18 37 23.4	2.753	1	20 08 35.37	2.0396	14 50 38.7	6.572
2	18 31 43.87	2.0807	18 34 35.6	2.840	2	20 10 37.72	2.0387	14 44 02.2	6.644
3	18 33 48.69	2.0799	18 31 42.6	2.926	3	20 12 40.02	2.0379	14 37 21.4	6.715
4	18 35 53.46	2.0792	18 28 44.5	3.012	4	20 14 42.27	2.0371	14 30 36.4	6.785
5	18 37 58.20	2.0786	18 25 41.2	3.097	5	20 16 44.47	2.0363	14 23 47.2	6.855
6	18 40 02.89	2.0778	18 22 32.8	3.182	6	20 18 46.63	2.0356	14 16 53.8	6.924
7	18 42 07.54	2.0771	18 19 19.3	3.267	7	20 20 48.74	2.0347	14 09 56.3	6.992
8	18 44 12.14	2.0763	18 16 00.7	3.352	8	20 22 50.80	2.0340	14 02 54.7	7.061
9	18 46 16.70	2.0756	18 12 37.0	3.437	9	20 24 52.82	2.0333	13 55 49.0	7.129
10	18 48 21.21	2.0747	18 09 08.3	3.521	10	20 26 54.80	2.0326	13 48 39.2	7.197
11	18 50 25.67	2.0739	18 05 34.5	3.605	11	20 28 56.73	2.0318	13 41 25.4	7.264
12	18 52 30.08	2.0732	18 01 55.7	3.688	12	20 30 58.62	2.0312	13 34 07.5	7.332
13	18 54 34.45	2.0723	17 58 11.9	3.772	13	20 33 00.47	2.0305	13 26 45.6	7.397
14	18 56 38.76	2.0714	17 54 23.0	3.857	14	20 35 02.28	2.0298	13 19 19.8	7.463
15	18 58 43.02	2.0706	17 50 29.1	3.939	15	20 37 04.05	2.0292	13 11 50.0	7.529
16	19 00 47.23	2.0697	17 46 30.3	4.022	16	20 39 05.79	2.0287	13 04 16.3	7.594
17	19 02 51.39	2.0689	17 42 26.5	4.104	17	20 41 07.49	2.0281	12 56 38.7	7.658
18	19 04 55.50	2.0681	17 38 17.8	4.187	18	20 43 09.16	2.0276	12 48 57.3	7.722
19	19 06 59.56	2.0672	17 34 04.1	4.269	19	20 45 10.80	2.0270	12 41 12.0	7.787
20	19 09 03.56	2.0662	17 29 45.5	4.350	20	20 47 12.40	2.0264	12 33 22.9	7.849
21	19 11 07.51	2.0653	17 25 22.1	4.431	21	20 49 13.97	2.0259	12 25 30.1	7.912
22	19 13 11.40	2.0644	17 20 53.8	4.512	22	20 51 15.51	2.0255	12 17 33.5	7.975
23	19 15 15.24	+ 2.0635	S.17 16 20.6	+ 4.594	23	20 53 17.03	+ 2.0251	S.12 09 33.1	+ 8.037
	MONDAY 26.					**WEDNESDAY 28.**			
0	19 17 19.02	+ 2.0626	S.17 11 42.5	+ 4.675	0	20 55 18.52	+ 2.0247	S.12 01 29.1	+ 8.098
1	19 19 22.75	2.0617	17 06 59.6	4.754	1	20 57 19.99	2.0242	11 53 21.4	8.158
2	19 21 26.42	2.0607	17 02 12.0	4.833	2	20 59 21.43	2.0239	11 45 10.1	8.219
3	19 23 30.03	2.0597	16 57 19.6	4.913	3	21 01 22.86	2.0236	11 36 55.1	8.279
4	19 25 33.59	2.0589	16 52 22.4	4.993	4	21 03 24.26	2.0232	11 28 36.6	8.338
5	19 27 37.10	2.0579	16 47 20.4	5.072	5	21 05 25.65	2.0230	11 20 14.6	8.397
6	19 29 40.54	2.0569	16 42 13.8	5.150	6	21 07 27.02	2.0227	11 11 49.0	8.456
7	19 31 43.93	2.0560	16 37 02.4	5.229	7	21 09 28.38	2.0226	11 03 19.9	8.513
8	19 33 47.26	2.0551	16 31 46.3	5.307	8	21 11 29.73	2.0224	10 54 47.4	8.571
9	19 35 50.54	2.0542	16 26 25.6	5.383	9	21 13 31.07	2.0222	10 46 11.4	8.628
10	19 37 53.76	2.0532	16 21 00.3	5.460	10	21 15 32.40	2.0221	10 37 32.0	8.685
11	19 39 56.92	2.0522	16 15 30.4	5.537	11	21 17 33.72	2.0220	10 28 49.2	8.741
12	19 42 00.02	2.0512	16 09 55.8	5.614	12	21 19 35.04	2.0220	10 20 03.1	8.796
13	19 44 03.07	2.0503	16 04 16.7	5.690	13	21 21 36.36	2.0219	10 11 13.7	8.851
14	19 46 06.06	2.0494	15 58 33.0	5.766	14	21 23 37.67	2.0219	10 02 21.0	8.905
15	19 48 09.00	2.0485	15 52 44.8	5.841	15	21 25 38.99	2.0220	9 53 25.1	8.959
16	19 50 11.88	2.0475	15 46 52.1	5.916	16	21 27 40.31	2.0221	9 44 25.9	9.012
17	19 52 14.70	2.0466	15 40 54.9	5.991	17	21 29 41.64	2.0222	9 35 23.6	9.065
18	19 54 17.47	2.0457	15 34 53.2	6.065	18	21 31 42.98	2.0224	9 26 18.1	9.117
19	19 56 20.19	2.0448	15 28 47.1	6.138	19	21 33 44.33	2.0226	9 17 09.5	9.169
20	19 58 22.85	2.0439	15 22 36.6	6.212	20	21 35 45.69	2.0228	9 07 57.8	9.221
21	20 00 25.46	2.0431	15 16 21.7	6.285	21	21 37 47.06	2.0231	8 58 43.0	9.272
22	20 02 28.02	2.0422	15 10 02.4	6.357	22	21 39 48.46	2.0234	8 49 25.2	9.322
23	20 04 30.52	2.0412	15 03 38.8	6.429	23	21 41 49.87	2.0237	8 40 04.4	9.372
24	20 06 32.97	+ 2.0404	S.14 57 10.9	+ 6.501	24	21 43 51.30	+ 2.0241	S. 8 30 40.6	+ 9.421

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 29.					**SATURDAY 31.**			
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 43 51.30	+2.0241	S. 8 30 40.6	+9.421	0	23 22 18.69	+2.0972	S. 0 13 31.9	+11.032
1	21 45 52.76	2.0246	8 21 13.9	9.469	1	23 24 24.61	2.1000	S. 0 02 29.5	11.048
2	21 47 54.25	2.0250	8 11 44.3	9.517	2	23 26 30.69	2.1028	N. 0 08 33.9	11.064
3	21 49 55.76	2.0255	8 02 11.9	9.564	3	23 28 36.95	2.1058	0 19 38.2	11.077
4	21 51 57.31	2.0261	7 52 36.6	9.611	4	23 30 43.39	2.1087	0 30 43.2	11.090
5	21 53 58.89	2.0266	7 42 58.6	9.657	5	23 32 50.00	2.1117	0 41 49.0	11.102
6	21 56 00.50	2.0272	7 33 17.8	9.703	6	23 34 56.80	2.1149	0 52 55.5	11.113
7	21 58 02.16	2.0280	7 23 34.2	9.748	7	23 37 03.79	2.1180	1 04 02.6	11.123
8	22 00 03.86	2.0287	7 13 48.0	9.792	8	23 39 10.96	2.1211	1 15 10.3	11.133
9	22 02 05.60	2.0294	7 03 59.1	9.837	9	23 41 18.32	2.1244	1 26 18.6	11.142
10	22 04 07.39	2.0302	6 54 07.6	9.880	10	23 43 25.89	2.1277	1 37 27.4	1 149
11	22 06 09.23	2.0311	6 44 13.5	9.922	11	23 45 33.65	2.1310	1 48 36.5	11.155
12	22 08 11.12	2.0320	6 34 16.9	9.964	12	23 47 41.61	2.1344	1 59 46.0	11.161
13	22 10 13.07	2.0329	6 24 17.8	10.006	13	23 49 49.78	2.1379	2 10 55.8	11.166
14	22 12 15.07	2.0338	6 14 16.2	10.047	14	23 51 58.16	2.1414	2 22 05.9	11.170
15	22 14 17.13	2.0349	6 04 12.1	10.087	15	23 54 06.75	2.1450	2 33 16.2	11.172
16	22 16 19.26	2.0361	5 54 05.7	10.127	16	23 56 15.56	2.1486	2 44 26.6	11.174
17	22 18 21.46	2.0372	5 43 56.9	10.167	17	23 58 24.58	2.1522	2 55 37.1	11.175
18	22 20 23.72	2.0383	5 33 45.7	10.205	18	0 00 33.83	2.1560	3 06 47.6	11.174
19	22 22 26.06	2.0396	5 23 32.3	10.243	19	0 02 43.30	2.1597	3 17 58.0	11.172
20	22 24 28.47	2.0408	5 13 16.6	10.280	20	0 04 53.00	2.1637	3 29 08.3	11.171
21	22 26 30.96	2.0422	5 02 58.7	10.317	21	0 07 02.94	2.1676	3 40 18.5	11.167
22	22 28 33.54	2.0436	4 52 38.6	10.352	22	0 09 13.11	2.1715	3 51 28.4	11.162
23	22 30 36.19	+2.0449	S. 4 42 16.4	+10.387	23	0 11 23.52	+2.1755	N. 4 02 38.0	+11.157
	FRIDAY 30.					**SUNDAY, JUNE 1.**			
0	22 32 38.93	+2.0464	S. 4 31 52.1	+10.422	0	0 13 34.17	+2.1796	N. 4 13 47.2	+11.150
1	22 34 41.76	2.0479	4 21 25.8	10.456					
2	22 36 44.68	2.0495	4 10 57.4	10.489					
3	22 38 47.70	2.0512	4 00 27.1	10.522					
4	22 40 50.82	2.0528	3 49 54.8	10.553					
5	22 42 54.04	2.0546	3 39 20.7	10.584					
6	22 44 57.37	2.0563	3 28 44.7	10.615					
7	22 47 00.80	2.0581	3 18 06.9	10.644					
8	22 49 04.34	2.0600	3 07 27.4	10.673					
9	22 51 08.00	2.0620	2 56 46.1	10.702					
10	22 53 11.78	2.0639	2 46 03.2	10.729					
11	22 55 15.67	2.0558	2 35 18.6	10.757					
12	22 57 19.68	2.0679	2 24 32.4	10.782					
13	22 59 23.82	2.0701	2 13 44.7	10.807					
14	23 01 28.09	2.0723	2 02 55.5	10.832					
15	23 03 32.50	2.0746	1 52 04.9	10.855					
16	23 05 37.04	2.0768	1 41 12.9	10.878					
17	23 07 41.72	2.0792	1 30 19.5	10.901					
18	23 09 46.55	2.0817	1 19 24.8	10.922					
19	23 11 51.52	2.0841	1 08 28.9	10.942					
20	23 13 56.64	2.0867	0 57 31.7	10.962					
21	23 16 01.92	2.0892	0 46 33.4	10.982					
22	23 18 07.35	2.0918	0 35 33.9	11.000					
23	23 20 12.94	2.0945	0 24 33.4	11.017					
24	23 22 18.69	+2.0972	S. 0 13 31.9	+11.032					

PHASES OF THE MOON.

		d	h	m
●	New Moon . . . . May	7	10	45.2
☽	First Quarter	14	01	39.7
○	Full Moon	21	22	46.1
☾	Last Quarter	30	00	00.4

		d	h
☾	Perigee . . . . May	8	07.4
☾	Apogee	23	02.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Spica	W.	114 03 55	2787	115 38 40	2772	117 13 45	2756	118 49 11	2740
	Antares	W.	68 40 18	2829	70 14 08	2813	71 48 19	2796	73 22 52	2779
	SATURN	W.	19 22 29	2946	20 53 50	2911	22 25 55	2879	23 58 41	2849
	VENUS	E.	38 00 42	3179	36 34 08	3165	35 07 17	3151	33 40 09	3136
	SUN	E.	83 43 28	3133	82 15 58	3115	80 48 07	3098	79 19 55	3081
2	Antares	W.	81 21 12	2692	82 58 02	2675	84 35 15	2657	86 12 53	2639
	α Aquilæ	W.	36 42 50	3957	37 55 12	3847	39 09 26	3746	40 25 24	3653
	SATURN	W.	31 51 34	2721	33 27 46	2698	35 04 29	2675	36 41 42	2653
	SUN	E.	71 53 29	2989	70 23 03	2971	68 52 14	2952	67 21 01	2932
3	Antares	W.	94 27 13	2547	96 07 21	2529	97 47 54	2510	99 28 53	2492
	α Aquilæ	W.	47 07 49	3289	48 32 13	3231	49 57 45	3176	51 24 23	3124
	SATURN	W.	44 55 06	2547	46 35 14	2527	48 15 50	2506	49 56 55	2486
	JUPITER	W.	27 25 46	2640	29 03 46	2612	30 42 24	2585	32 21 39	2559
	SUN	E.	59 38 39	2833	58 04 54	2813	56 30 43	2793	54 56 06	2773
4	Antares	W.	108 00 12	2403	109 43 43	2385	111 27 39	2368	113 11 59	2351
	α Aquilæ	W.	58 52 05	2908	60 24 14	2871	61 57 10	2835	63 30 52	2802
	SATURN	W.	58 29 23	2387	60 13 17	2368	61 57 38	2349	63 42 26	2331
	JUPITER	W.	40 46 34	2441	42 29 10	2419	44 12 17	2398	45 55 54	2378
	SUN	E.	46 56 24	2674	45 19 09	2654	43 41 27	2635	42 03 20	2615
5	SATURN	W.	72 33 03	2243	74 20 26	2227	76 08 14	2210	77 56 26	2195
	α Aquilæ	W.	71 29 31	2660	73 07 05	2635	74 45 12	2612	76 23 50	2591
	JUPITER	W.	54 41 09	2283	56 27 34	2266	58 14 24	2248	60 01 40	2232
	SUN	E.	33 46 20	2525	32 05 42	2509	30 24 41	2492	28 43 17	2477
9	SUN	W.	22 08 26	2302	23 54 23	2307	25 40 12	2313	27 25 53	2319
	Regulus	E.	78 39 43	2032	76 46 58	2036	74 54 20	2042	73 01 51	2049
	Spica	E.	132 22 27	2012	130 29 11	2017	128 36 03	2023	126 43 04	2029
10	SUN	W.	36 11 35	2362	37 56 04	2373	39 40 17	2384	41 24 15	2395
	Regulus	E.	63 42 25	2093	61 51 15	2105	60 00 23	2116	58 09 48	2127
	Spica	E.	117 20 59	2071	115 29 15	2081	113 37 46	2091	111 46 33	2102
11	SUN	W.	49 59 38	2462	51 41 44	2477	53 23 30	2492	55 04 55	2507
	Regulus	E.	49 01 44	2197	47 13 12	2213	45 25 04	2229	43 37 20	2245
	Spica	E.	102 34 58	2165	100 45 37	2178	98 56 37	2192	97 07 57	2206
12	SUN	W.	63 26 35	2587	65 05 48	2604	66 44 38	2620	68 23 06	2638
	Spica	E.	88 10 07	2281	86 23 40	2298	84 37 37	2312	82 51 55	2328
13	SUN	W.	76 29 36	2723	78 05 45	2741	79 41 31	2757	81 16 55	2774
	Spica	E.	74 09 15	2408	72 25 52	2424	70 42 52	2440	69 00 14	2456
	Antares	E.	119 27 58	2456	117 45 43	2470	116 03 48	2485	114 22 14	2500
14	SUN	W.	89 08 21	2859	90 41 33	2876	92 14 23	2891	93 46 53	2907
	Pollux	W.	32 09 44	2866	33 42 47	2854	35 16 05	2845	36 49 34	2839
	Spica	E.	60 32 40	2534	58 52 14	2550	57 12 10	2564	55 32 26	2580
	Antares	E.	105 59 32	2574	104 20 01	2588	102 40 50	2602	101 01 58	2617

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVʰ.	P. L. of Diff.	XVIIIʰ.	P. L. of Diff.	XXIʰ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Spica	W.	120 24 58	2724	122 01 06	2707	123 37 36	2690	125 14 29	2672
	Antares	W.	74 57 47	2763	76 33 04	2746	78 08 43	2728	79 44 46	2710
	SATURN	W.	25 32 05	2820	27 06 07	2793	28 40 44	2769	30 15 53	2744
	VENUS	E.	32 12 43	3122	30 45 00	3109	29 17 01	3094	27 48 44	3080
	SUN	E.	77 51 22	3064	76 22 28	3045	74 53 11	3026	73 23 31	3009
2	Antares	W.	87 50 55	2621	89 29 22	2602	91 08 14	2584	92 47 31	2566
	α Aquilæ	W.	41 43 01	3571	43 02 07	3493	44 22 39	3418	45 44 35	3350
	SATURN	W.	38 19 25	2632	39 57 37	2611	41 36 17	2589	43 15 27	2568
	SUN	E.	65 49 23	2912	64 17 20	2892	62 44 51	2873	61 11 58	2853
3	Antares	W.	101 10 18	2473	102 52 09	2456	104 34 24	2438	106 17 05	2419
	α Aquilæ	W.	52 52 03	3076	54 20 42	3031	55 50 16	2987	57 20 45	2946
	SATURN	W.	51 38 28	2465	53 20 30	2446	55 02 59	2426	56 45 57	2406
	JUPITER	W.	34 01 30	2534	35 41 56	2510	37 22 56	2486	39 04 29	2463
	SUN	E.	53 21 03	2753	51 45 33	2732	50 09 36	2713	48 33 13	2693
4	Antares	W.	114 56 44	2335	116 41 52	2320	118 27 23	2304	120 13 17	2289
	α Aquilæ	W.	65 05 17	2771	66 40 23	2741	68 16 08	2712	69 52 32	2686
	SATURN	W.	65 27 41	2312	67 13 23	2294	68 59 31	2277	70 46 04	2260
	JUPITER	W.	47 40 01	2357	49 24 37	2339	51 09 40	2320	52 55 11	2301
	SUN	E.	40 24 46	2597	38 45 47	2579	37 06 23	2561	35 26 34	2543
5	SATURN	W.	79 45 01	2180	81 33 58	2166	83 23 17	2151	85 12 58	2137
	α Aquilæ	W.	78 02 57	2571	79 42 32	2553	81 22 32	2535	83 02 57	2517
	JUPITER	W.	61 49 20	2216	63 37 23	2202	65 25 48	2186	67 14 36	2172
	SUN	E.	27 01 31	2462	25 19 24	2447	23 36 56	2433	21 54 08	2419
9	SUN	W.	29 11 25	2327	30 56 45	2335	32 41 54	2342	34 26 51	2352
	Regulus	E.	71 09 33	2056	69 17 26	2064	67 25 32	2073	65 33 51	2083
	Spica	E.	124 50 15	2037	122 57 38	2044	121 05 12	2052	119 12 58	2061
10	SUN	W.	43 07 57	2408	44 51 20	2421	46 34 25	2434	48 17 11	2448
	Regulus	E.	56 19 30	2140	54 29 32	2154	52 39 55	2168	50 50 39	2182
	Spica	E.	109 55 37	2114	108 04 59	2126	106 14 40	2138	104 24 39	2151
11	SUN	W.	56 45 59	2522	58 26 41	2538	60 07 01	2554	61 46 59	2570
	Regulus	E.	41 50 00	2264	40 03 07	2282	38 16 41	2300	36 30 42	2320
	Spica	E.	95 19 39	2221	93 31 43	2236	91 44 09	2251	89 56 57	2265
12	SUN	W.	70 01 10	2655	71 38 51	2672	73 16 09	2689	74 53 04	2706
	Spica	E.	81 06 37	2344	79 21 42	2360	77 37 10	2376	75 53 01	2392
13	SUN	W.	82 51 57	2792	84 26 36	2809	86 00 52	2825	87 34 47	2842
	Spica	E.	67 17 59	2472	65 36 06	2488	63 54 36	2503	62 13 27	2519
	Antares	E.	112 41 01	2515	111 00 08	2530	109 19 36	2544	107 39 24	2559
14	SUN	W.	95 19 03	2924	96 50 52	2939	98 22 22	2954	99 53 33	2970
	Pollux	W.	38 23 12	2835	39 56 54	2833	41 30 39	2833	43 04 24	2835
	Spica	E.	53 53 03	2594	52 14 00	2609	50 35 17	2623	48 56 53	2637
	Antares	E.	99 23 26	2632	97 45 14	2646	96 07 21	2660	94 29 47	2674

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P.L. of Diff.	III^h.	P.L. of Diff.	VI^h.	P.L. of Diff.	IX^h.	P.L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
15	Sun	W.	101 24 23	2985	102 54 55	3000	104 25 08	3014	105 55 03	3029
	Pollux	W.	44 38 06	2838	46 11 45	2841	47 45 20	2845	49 18 49	2851
	Spica	E.	47 18 48	2651	45 41 02	2666	44 03 36	2678	42 26 27	2692
	Antares	E.	92 52 32	2687	91 15 35	2701	89 38 57	2714	88 02 36	2728
16	Sun	W.	113 20 19	3096	114 48 33	3109	116 16 32	3121	117 44 16	3134
	Pollux	W.	57 04 16	2884	58 36 55	2891	60 09 25	2898	61 41 46	2906
	Spica	E.	34 25 04	2755	32 49 37	2766	31 14 25	2779	29 39 29	2789
	Antares	E.	80 05 12	2792	78 30 33	2804	76 56 10	2815	75 22 02	2827
	a Aquilæ	E.	128 12 31	3417	126 50 34	3402	125 28 20	3390	124 05 52	3379
	Saturn	E.	129 34 37	2778	127 59 40	2788	126 24 57	2798	124 50 27	2808
17	Pollux	W.	69 21 04	2945	70 52 26	2953	72 23 38	2960	73 54 41	2967
	Regulus	W.	32 21 58	2901	33 54 15	2906	35 26 26	2911	36 58 31	2916
	Spica	E.	21 48 25	2844	20 14 54	2854	18 41 36	2865	17 08 32	2876
	Antares	E.	67 35 06	2883	66 02 26	2894	64 30 00	2905	62 57 47	2915
	Saturn	E.	117 01 10	2856	115 27 55	2866	113 54 52	2874	112 22 00	2883
	a Aquilæ	E.	117 10 52	3344	115 47 31	3341	114 24 07	3338	113 00 39	3336
18	Pollux	W.	81 27 35	3004	82 57 43	3011	84 27 41	3018	85 57 31	3025
	Regulus	W.	44 37 06	2946	46 08 27	2952	47 39 40	2958	49 10 46	2963
	Antares	E.	55 19 58	2966	53 49 02	2976	52 18 19	2986	50 47 48	2996
	Saturn	E.	104 40 20	2923	103 08 30	2931	101 36 50	2937	100 05 18	2944
	a Aquilæ	E.	106 03 05	3337	104 39 36	3339	103 16 10	3341	101 52 46	3343
	Jupiter	E.	123 37 19	2962	122 06 18	2968	120 35 25	2974	119 04 40	2980
19	Pollux	W.	93 24 36	3059	94 53 36	3065	96 22 29	3071	97 51 14	3077
	Regulus	W.	56 44 30	2991	58 14 54	2996	59 45 12	3001	61 15 24	3005
	Antares	E.	43 18 23	3047	41 49 08	3058	40 20 07	3069	38 51 20	3081
	Saturn	E.	92 29 47	2976	90 59 05	2982	89 28 30	2988	87 58 02	2993
	a Aquilæ	E.	94 56 38	3362	93 33 38	3367	92 10 44	3372	90 47 55	3378
	Jupiter	E.	111 32 48	3010	110 02 48	3015	108 32 54	3020	107 03 06	3026
20	Pollux	W.	105 13 06	3108	106 41 06	3114	108 08 59	3120	109 36 44	3126
	Regulus	W.	68 44 55	3028	70 14 33	3033	71 44 05	3036	73 13 33	3039
	Spica	W.	14 54 58	3014	16 24 53	3019	17 54 42	3023	19 24 26	3026
	Antares	E.	31 31 20	3153	30 04 15	3171	28 37 31	3191	27 11 11	3214
	Saturn	E.	80 27 23	3019	78 57 34	3023	77 27 50	3028	75 58 12	3032
	a Aquilæ	E.	83 55 30	3408	82 33 23	3416	81 11 25	3423	79 49 35	3431
	Jupiter	E.	99 35 40	3048	98 06 27	3053	96 37 20	3057	95 08 18	3061
21	Pollux	W.	116 53 39	3157	118 20 39	3163	119 47 32	3170	121 14 17	3177
	Regulus	W.	80 39 45	3057	82 08 47	3060	83 37 45	3063	85 06 40	3065
	Spica	W.	26 52 10	3042	28 21 31	3045	29 50 48	3047	31 20 03	3049
	Saturn	E.	68 31 17	3052	67 02 08	3056	65 33 04	3059	64 04 04	3062
	a Aquilæ	E.	73 02 50	3478	71 42 01	3489	70 21 25	3500	69 01 01	3512
	Jupiter	E.	87 44 15	3078	86 15 39	3081	84 47 07	3084	83 18 38	3087
22	Regulus	W.	92 30 28	3078	93 59 05	3079	95 27 40	3081	96 56 13	3082
	Spica	W.	38 45 31	3060	40 14 29	3062	41 43 24	3064	43 12 18	3065
	Saturn	E.	56 40 01	3077	55 11 23	3080	53 42 49	3082	52 14 17	3085
	a Aquilæ	E.	62 22 37	3584	61 03 45	3601	59 45 12	3620	58 27 00	3639

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
15	Sun	W.	107 24 40	3043	108 54 00	3056	110 23 03	3070	111 51 49	3083
	Pollux	W.	50 52 10	2857	52 25 24	2863	53 58 30	2870	55 31 27	2877
	Spica	E.	40 49 36	2705	39 13 03	2718	37 36 47	2730	36 00 47	2743
	Antares	E.	86 26 33	2741	84 50 48	2753	83 15 19	2766	81 40 07	2779
16	Sun	W.	119 11 44	3146	120 38 58	3158	122 05 57	3169	123 32 43	3179
	Pollux	W.	63 13 57	2914	64 45 58	2921	66 17 50	2929	67 49 32	2937
	Spica ·	E.	28 04 47	2801	26 30 20	2812	24 56 08	2823	23 22 10	2833
	Antares	E.	73 48 09	2838	72 14 31	2850	70 41 09	2862	69 08 01	2872
	a Aquilæ	E.	122 43 12	3370	121 20 21	3360	119 57 19	3353	118 34 09	3348
	Saturn	E.	123 16 10	2818	121 42 06	2829	120 08 16	2838	118 34 37	2847
17	Pollux	W.	75 25 35	2975	76 56 19	2983	78 26 53	2990	79 57 18	2997
	Regulus	W.	38 30 29	2923	40 02·19	2928	41 34 02	2934	43 05 38	2940
	Spica	E.	15 35 42	2887	14 03 06	2898	12 30 44	2909	10 58 36	2919
	Antares	E.	61 25 47	2925	59 54 00	2936	58 22 27	2946	56 51 06	2956
	Saturn	E.	110 49 19	2891	109 16 49	2899	107 44 29	2908	106 12 20	2915
	a Aquilæ	E.	111 37 09	3335	110 13 38	3335	108 50 07	3335	107 26 36	3335
18	Pollux	W.	87 27 13	3032	88 56 46	3039	90 26 11	3045	91 55 28	3052
	Regulus	W.	50 41 45	2969	52 12 36	2974	53 43 21	2980	55 13 59	2985
	Antares	E.	49 17 30	3005	47 47 24	3016	46 17 31	3026	44 47 51	3036
	Saturn	E.	98 33 55	2951	97 02 41	2958	95 31 35	2964	94 00 37	2970
	a Aquilæ	E.	100 29 24	3346	99 06 06	3350	97 42 52	3354	96 19 43	3358
	Jupiter	E.	117 34 02	2987	116 03 33	2993	114 33 11	2998	113 02 56	3004
19	Pollux	W.	99 19 52	3083	100 48 22	3090	102 16 44	3096	103 44 59	3102
	Regulus	W.	62 45 30	3011	64 15 29	3015	65 45 23	3019	67 15 12	3024
	Antares	E.	37 22 48	3093	35 54 30	3107	34 26 29	3122	32 58 45	3137
	Saturn	E.	86 27 41	3000	84 57 27	3005	83 27 20	3009	81 57 19	3014
	a Aquilæ	E.	89 25 13	3383	88 02 37	3388	86 40 07	3395	85 17 45	3401
	Jupiter	E.	105 33 25	3030	104 03 50	3035	102 34 21	3040	101 04 58	3044
20	Pollux	W.	111 04 22	3133	112 31 52	3138	113 59 15	3144	115 26 31	3151
	Regulus	W.	74 42 57	3043	76 12 16	3048	77 41 29	3051	79 10 39	3054
	Spica	W.	20 54 06	3029	22 23 43	3033	23 53 15	3035	25 22 44	3038
	Antares	E.	25 45 18	3241	24 19 58	3272	22 55 14	3306	21 31 10	3344
	Saturn	E.	74 28 39	3036	72 59 11	3040	71 29 49	3044	70 00 31	3048
	a Aquilæ	E.	78 27 54	3440	77 06 23	3448	75 45 01	3458	74 23 50	3468
	Jupiter	E.	93 39 20	3065	92 10 27	3069	90 41 39	3072	89 12 55	3075
21	Pollux	W.	122 40 53	3184	124 07 21	3192	125 33 39	3199	126 59 49	3206
	Regulus ·	W.	86 35 32	3068	88 04 20	3071	89 33 05	3073	91 01 48	3075
	Spica	W.	32 49 15	3052	34 18 23	3055	35 47 28	3056	37 16 31	3058
	Saturn	E.	62 35 08	3065	61 06 16	3068	59 37 27	3071	58 08 42	3074
	a Aquilæ	E.	67 40 50	3525	66 20 53	3539	65 01 12	3553	63 41 46	3568
	Jupiter	E.	81 50 13	3090	80 21 51	3093	78 53 33	3095	77 25 17	3097
22	Regulus	W.	98 24 44	3084	99 53 13	3086	101 21 40	3087	102 50 06	3087
	Spica	W.	44 41 10	3067	46 10 00	3068	47 38 49	3069	49 07 37	3070
	Saturn	E.	50 45 49	3088	49 17 24	3091	47 49 03	3093	46 20 44	3095
	a Aquilæ	E.	57 09 08	3660	55 51 38	3683	54 34 33	3708	53 17 54	3733

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	JUPITER E .	75 57 04	3100	74 28 54	3101	73 00 46	3103	71 32 40	3105
23	Regulus W.	104 18 31	3088	105 46 55	3090	107 15 17	3090	108 43 39	3091
	Spica W.	50 36 23	3070	52 05 09	3071	53 33 54	3071	55 02 39	3070
	SATURN E .	44 52 28	3097	43 24 15	3100	41 56 05	3102	40 27 58	3105
	α Aquilæ E .	52 01 42	3761	50 45 59	3792	49 30 48	3825	48 16 12	3860
	JUPITER E .	64 12 42	3112	62 44 47	3113	61 16 54	3114	59 49 02	3115
	VENUS E .	124 29 09	3503	123 08 48	3502	121 48 26	3502	120 28 04	3502
24	Regulus W.	116 05 25	3090	117 33 47	3090	119 02 09	3089	120 30 32	3087
	Spica W.	62 26 30	3068	63 55 19	3067	65 24 09	3065	66 53 01	3064
	Antares W.	18 22 42	3440	19 44 13	3393	21 06 37	3351	22 29 49	3315
	SATURN E .	33 08 14	3121	31 40 30	3125	30 12 51	3129	28 45 17	3135
	α Aquilæ E .	42 13 26	4097	41 03 21	4161	39 54 18	4230	38 46 20	4305
	JUPITER E .	52 29 52	3118	51 02 04	3118	49 34 16	3118	48 06 28	3118
	VENUS E .	113 46 09	3498	112 25 43	3497	111 05 16	3495	109 44 47	3493
25	Spica W.	74 17 54	3052	75 47 02	3049	77 16 14	3046	78 45 30	3042
	Antares W.	29 34 22	3202	31 00 29	3185	32 26 56	3173	33 53 39	3159
	JUPITER E .	40 47 28	3118	39 19 39	3119	37 51 52	3119	36 24 05	3119
	VENUS E .	103 01 43	3480	101 40 57	3477	100 20 07	3473	98 59 13	3469
26	Spica W.	86 13 06	3019	87 42 55	3014	89 12 50	3008	90 42 52	3002
	Antares W.	41 10 52	3103	42 38 57	3093	44 07 15	3083	45 35 45	3073
	VENUS E .	92 13 27	3444	90 52 00	3438	89 30 27	3432	88 08 47	3425
	SUN E .	135 33 12	3388	134 10 42	3382	132 48 06	3376	131 25 22	3369
27	Spica W.	98 15 05	2968	99 45 58	2959	101 17 02	2951	102 48 16	2942
	Antares W.	53 01 17	3024	54 31 00	3014	56 00 55	3004	57 31 03	2993
	VENUS E .	81 18 26	3387	79 55 55	3378	78 33 14	3369	77 10 22	3359
	SUN E .	124 29 37	3330	123 06 01	3321	121 42 14	3312	120 18 16	3302
28	Spica W.	110 27 24	2893	111 59 52	2882	113 32 33	2871	115 05 29	2860
	Antares W.	65 05 08	2937	66 36 40	2925	68 08 26	2913	69 40 28	2901
	SATURN W.	16 11 25	3096	17 39 39	3056	19 08 42	3020	20 38 30	2987
	VENUS E .	70 13 11	3306	68 49 07	3295	67 24 50	3282	66 00 18	3270
	SUN E .	113 15 32	3249	111 50 21	3237	110 24 56	3225	108 59 16	3212
29	Antares W.	77 24 43	2835	78 58 25	2821	80 32 26	2807	82 06 45	2792
	SATURN W.	28 16 42	2861	29 49 50	2840	31 23 27	2820	32 57 29	2801
	VENUS E .	58 53 50	3202	57 27 43	3188	56 01 20	3173	54 34 38	3157
	SUN E .	101 47 05	3144	100 19 49	3129	98 52 15	3114	97 24 23	3099
30	Antares W.	90 03 17	2715	91 39 37	2700	93 16 17	2683	94 53 20	2667
	SATURN W.	40 53 53	2707	42 30 24	2688	44 07 20	2669	45 44 41	2651
	VENUS E .	47 16 22	3076	45 47 43	3060	44 18 44	3042	42 49 23	3024
	SUN E .	90 00 12	3017	88 30 20	3000	87 00 07	2982	85 29 32	2965
31	Antares W.	103 04 06	2583	104 43 25	2566	106 23 06	2549	108 03 11	2532
	SATURN W.	53 57 39	2559	55 37 31	2540	57 17 49	2521	58 58 33	2502
	VENUS E .	35 17 08	2935	33 45 33	2917	32 13 36	2899	30 41 16	2881
	SUN E .	77 50 57	2873	76 18 04	2854	74 44 46	2835	73 11 03	2816

		GREENWICH MEAN TIME.								

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L of Diff.	XXI^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	Jupiter	E .	70 04 37	3107	68 36 36	3108	67 08 36	3110	65 40 38	3111
23	Regulus	W.	110 12 00	3091	111 40 21	3091	113 08 42	3091	114 37 03	3090
	Spica	W.	56 31 25	3071	58 00 10	3070	59 28 56	3069	60 57 43	3069
	Saturn	E .	38 59 54	3108	37 31 54	3110	36 03 57	3113	34 36 03	3117
	a Aquilæ	E .	47 02 12	3900	45 48 52	3943	44 36 16	3989	43 24 26	4040
	Jupiter	E .	58 21 11	3115	56 53 20	3116	55 25 31	3116	53 57 41	3117
	Venus	E .	119 07 42	3502	117 47 20	3501	116 26 57	3500	115 06 33	3500
24	Regulus	W.	121 58 57	3087	123 27 23	3086	124 55 50	3084	126 24 19	3083
	Spica	W.	68 21 55	3062	69 50 51	3060	71 19 49	3058	72 48 50	3056
	Antares	W.	23 53 43	3284	25 18 13	3259	26 43 12	3238	28 08 36	3220
	Saturn	E .	27 17 50	3143	25 50 32	3151	24 23 25	3160	22 56 28	3170
	a Aquilæ	E .	37 39 32	4391	36 34 03	4489	35 30 01	4596	34 27 33	4716
	Jupiter	E .	46 38 40	3118	45 10 52	3118	43 43 04	3118	42 15 16	3118
	Venus	E .	108 24 15	3491	107 03 41	3489	105 43 05	3486	104 22 26	3483
25	Spica	W.	80 14 51	3038	81 44 17	3034	83 13 47	3029	84 43 23	3024
	Antares	W.	35 20 37	3147	36 47 50	3135	38 15 17	3124	39 42 58	3113
	Jupiter	E .	34 56 18	3120	33 28 33	3121	32 00 49	3123	30 33 07	3125
	Venus	E .	97 38 14	3464	96 17 10	3460	94 56 02	3455	93 34 48	3449
26	Spica	W.	92 13 02	2996	93 43 20	2989	95 13 46	2982	96 44 21	2975
	Antares	W.	47 04 28	3064	48 33 22	3054	50 02 28	3044	51 31 46	3034
	Venus	E .	86 46 59	3419	85 25 04	3411	84 03 00	3403	82 40 48	3395
	Sun	E .	130 02 30	3362	128 39 30	3355	127 16 22	3346	125 53 04	3338
27	Spica	W.	104 19 42	2933	105 51 19	2924	107 23 08	2914	108 55 10	2904
	Antares	W.	59 01 25	2982	60 32 00	2971	62 02 48	2960	63 33 51	2949
	Venus	E .	75 47 19	3350	74 24 05	3340	73 00 40	3329	71 37 02	3318
	Sun	E .	118 54 07	3293	117 29 47	3282	116 05 15	3271	114 40 30	3260
28	Spica	W.	116 38 39	2848	118 12 05	2835	119 45 47	2823	121 19 45	2811
	Antares	W.	71 12 46	2888	72 45 20	2876	74 18 10	2862	75 51 18	2848
	Saturn	W.	22 08 59	2956	23 40 07	2929	25 11 50	2905	26 44 02	2883
	Venus	E .	64 35 31	3258	63 10 30	3244	61 45 13	3231	60 19 40	3216
	Sun	E .	107 33 22	3199	106 07 12	3186	104 40 46	3172	103 14 04	3158
29	Antares	W.	83 41 24	2777	85 16 23	2762	86 51 40	2747	88 27 18	2731
	Saturn	W.	34 31 56	2782	36 06 48	2763	37 42 04	2744	39 17 46	2725
	Venus	E .	53 07 37	3142	51 40 18	3125	50 12 39	3109	48 44 41	3092
	Sun	E .	95 56 12	3083	94 27 42	3067	92 58 52	3051	91 29 42	3034
30	Antares	W.	96 30 44	2651	98 08 30	2634	99 46 39	2617	101 25 11	2600
	Saturn	W.	47 22 26	2633	49 00 36	2614	50 39 12	2596	52 18 13	2577
	Venus	E .	41 19 40	3007	39 49 36	2989	38 19 09	2971	36 48 20	2953
	Sun	E .	83 58 35	2946	82 27 15	2929	80 55 33	2910	79 23 27	2891
31	Antares	W.	109 43 40	2515	111 24 32	2497	113 05 49	2480	114 47 30	2463
	Saturn	W.	60 39 43	2484	62 21 19	2465	64 03 22	2445	65 45 52	2426
	Venus	E .	29 08 33	2864	27 35 28	2847	26 02 01	2830	24 28 12	2811
	Sun	E .	71 36 56	2797	70 02 24	2778	68 27 27	2758	66 52 04	2738

JUNE, 1902.

AT GREENWICH APPARENT NOON.

Day of the Week	Day of the Month	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	4 33 35.96	+ 10.222	N.21 57 52.9	+ 21.05	15 47.30	68.29	2 31.84	0.364
Mon.	2	4 37 41.49	10.240	22 06 06.7	20.09	15 47.16	68.35	2 22.88	0.381
Tues.	3	4 41 47.43	10.256	22 13 57.5	19.12	15 47.03	68.40	2 13.51	0.398
Wed.	4	4 45 53.77	+ 10.272	22 21 24.9	+ 18.15	15 46.90	68.46	2 03.75	0.414
Thur.	5	4 50 00.50	10.287	22 28 28.9	17.17	15 46.78	68.51	1 53.60	0.430
Frid.	6	4 54 07.56	10.301	22 35 09.4	16.19	15 46.66	68.56	1 43.13	0.444
Sat.	7	4 58 14.95	+ 10.314	22 41 26.1	+ 15.20	15 46.54	68.60	1 32.33	0.457
SUN.	8	5 02 22.64	10.326	22 47 19.1	14.20	15 46.43	68.64	1 21.22	0.469
Mon.	9	5 06 30.61	10.337	22 52 48.1	13.20	15 46.32	68.68	1 09.84	0.479
Tues.	10	5 10 38.82	+ 10.347	22 57 52.8	+ 12.19	15 46.22	68.72	0 58.22	0.489
Wed.	11	5 14 47.27	10.356	23 02 33.3	11.18	15 46.12	68.75	0 46.36	0.498
Thur.	12	5 18 55.92	10.364	23 06 49.6	10.17	15 46.02	68.78	0 34.31	0.506
Frid.	13	5 23 04.75	+ 10.371	23 10 41.4	+ 9.15	15 45.93	68.80	0 22.07	0.513
Sat.	14	5 27 13.73	10.377	23 14 08.9	8.13	15 45.84	68.82	0 09.67	0.519
SUN.	15	5 31 22.84	10.382	23 17 11.7	7.10	15 45.76	68.84	0 02.85	0.524
Mon.	16	5 35 32.09	+ 10.387	23 19 49.8	+ 6.08	15 45.68	68.86	0 15.50	0.528
Tues.	17	5 39 41.43	10.391	23 22 03.3	5.05	15 45.60	68.87	0 28.25	0.532
Wed.	18	5 43 50.84	10.393	23 23 52.0	4.02	15 45.53	68.88	0 41.07	0.535
Thur.	19	5 48 00.32	+ 10.395	23 25 16.0	+ 2.98	15 45.46	68.89	0 53.95	0.537
Frid.	20	5 52 09.82	10.396	23 26 15.2	1.95	15 45.40	68.90	1 06.86	0.538
Sat.	21	5 56 19.35	10.396	23 26 49.6	+ 0.92	15 45.34	68.90	1 19.79	0.539
SUN.	22	6 00 28.87	+ 10.395	23 26 59.2	− 0.12	15 45.28	68.90	1 32.72	0.538
Mon.	23	6 04 38.35	10.394	23 26 44.0	1.15	15 45.23	68.89	1 45.62	0.536
Tues.	24	6 08 47.79	10.392	23 26 03.9	2.18	15 45.18	68.88	1 58.47	0.534
Wed.	25	6 12 57.17	+ 10.389	23 24 59.1	− 3.21	15 45.14	68.87	2 11.25	0.531
Thur.	26	6 17 06.46	10.385	23 23 29.5	4.24	15 45.11	68.85	2 23.94	0.527
Frid.	27	6 21 15.64	10.380	23 21 35.2	5.27	15 45.08	68.83	2 36.54	0.522
Sat.	28	6 25 24.70	+ 10.374	23 19 16.2	− 6.30	15 45.05	68.81	2 49.00	0.516
SUN.	29	6 29 33.60	10.368	23 16 32.6	7.32	15 45.03	68.78	3 01.32	0.509
Mon.	30	6 33 42.34	10.360	23 13 24.5	8.34	15 45.01	68.75	3 13.47	0.502
Tues.	31	6 37 50.88	+ 10.351	N. 23 09 52.1	− 9.36	15 45.00	68.72	3 25.42	0.493

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting 0.19ˢ from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	4 33 36.38	+ 10.220	N.21 57 53.8	+ 21.05	2 31.82	− 0.364	4 36 08.20
Mon.	2	4 37 41.89	10.238	22 06 07.5	20.09	2 22.86	0.381	4 40 04.75
Tues.	3	4 41 47.81	10.255	22 13 58.0	19.12	2 13.50	0.398	4 44 01.31
Wed.	4	4 45 54.13	+ 10.271	22 21 25.5	+ 18.15	2 03.74	− 0.414	4 47 57.87
Thur.	5	4 50 00.83	10.286	22 28 29.4	17.17	1 53.59	0.430	4 51 54.42
Frid.	6	4 54 07.86	10.300	22 35 09.8	16.19	1 43.12	0.444	4 55 50.98
Sat.	7	4 58 15.22	+ 10.313	22 41 26.5	+ 15.20	1 32.32	− 0.457	4 59 47.54
SUN.	8	5 02 22.88	10.325	22 47 19.4	14.20	1 21.21	0.469	5 03 44.09
Mon.	9	5 06 30.82	10.336	22 52 48.2	13.20	1 09.83	0.479	5 07 40.65
Tues.	10	5 10 39.00	+ 10.346	22 57 53.0	+ 12.19	0 58.21	− 0.489	5 11 37.21
Wed.	11	5 14 47.41	10.355	23 02 33.5	11.18	0 46.35	0.498	5 15 33.76
Thur.	12	5 18 56.02	10.363	23 06 49.7	10.17	0 34.30	0.506	5 19 30.32
Frid.	13	5 23 04.81	+ 10.370	23 10 41.5	+ 9.15	0 22.07	− 0.513	5 23 26.88
Sat.	14	5 27 13.76	10.376	23 14 08.9	8.13	0 09.67	0.519	5 27 23.43
SUN.	15	5 31 22.84	10.381	23 17 11.7	7.10	0 02.85	0.524	5 31 19.99
Mon.	16	5 35 32.05	+ 10.386	23 19 49.8	+ 6.08	0 15.50	− 0.528	5 35 16.55
Tues.	17	5 39 41.35	10.389	23 22 03.3	5.05	0 28.25	0.532	5 39 13.10
Wed.	18	5 43 50.72	10.392	23 23 52.0	4.02	0 41.06	0.535	5 43 09.66
Thur.	19	5 48 00.16	+ 10.394	23 25 16.0	+ 2.98	0 53.94	− 0.537	5 47 06.22
Frid.	20	5 52 09.62	10.395	23 26 15.2	1.95	1 06.85	0.538	5 51 02.77
Sat.	21	5 56 19.11	10.395	23 26 49.6	+ 0.92	1 19.78	0.539	5 54 59.33
SUN.	22	6 00 28.60	+ 10.394	23 26 59.2	− 0.12	1 32.71	− 0.538	5 58 55.89
Mon.	23	6 04 38.04	10.393	23 26 44.0	1.15	1 45.60	0.536	6 02 52.44
Tues.	24	6 08 47.45	10.391	23 26 04.0	2.18	1 58.45	0.534	6 06 49.00
Wed.	25	6 12 56.79	+ 10.388	23 24 59.2	− 3.21	2 11.23	− 0.531	6 10 45.56
Thur.	26	6 17 06.04	10.383	23 23 29.7	4.24	2 23.92	0.527	6 14 42.12
Frid.	27	6 21 15.19	10.378	23 21 35.4	5.27	2 36.52	0.522	6 18 38.67
Sat.	28	6 25 24.21	+ 10.373	23 19 16.5	− 6.30	2 48.98	− 0.516	6 22 35.23
SUN.	29	6 29 33.08	10.366	23 16 33.0	7.32	3 01.29	0.509	6 26 31.79
Mon.	30	6 33 41.78	10.358	23 13 25.0	8.34	3 13.44	0.502	6 30 28.34
Tues.	31	6 37 50.29	+ 10.349	N.23 09 52.6	− 9.36	3 25.39	− 0.493	6 34 24.90

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

Diff. for 1 Hour,
+ 9.8565ˢ.
(Table III.)

AT GREENWICH MEAN NOON.

THE SUN'S

Day of the Month.	Day of the Year.	TRUE LONGITUDE. λ	TRUE LONGITUDE. λ'	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	152	70 02 40.7	02 11.2	143.74	+ 0.36	0.006 1484	+ 27.7	19 20 41.13
2	153	70 60 09.9	59 40.2	143.70	0.23	0.006 2138	26.8	19 16 45.22
3	154	71 57 38.4	57 08.6	143.67	+ 0.09	0.006 2770	25.8	19 12 49.31
4	155	72 55 06.1	54 36.1	143.64	− 0.04	0.006 3378	+ 24.8	19 08 53.40
5	156	73 52 33.0	52 02.9	143.60	0.16	0.006 3962	23.8	19 04 57.49
6	157	74 49 59.1	49 28.8	143.57	0.27	0.006 4521	22.8	19 01 01.58
7	158	75 47 24.3	46 53.8	143.53	− 0.36	0.006 5055	+ 21.8	18 57 05.67
8	159	76 44 48.6	44 18.0	143.49	0.41	0.006 5563	20.7	18 53 09.76
9	160	77 42 11.8	41 41.1	143.45	0.43	0.006 6047	19.7	18 49 13.85
10	161	78 39 34.1	39 03.2	143.41	− 0.41	0.006 6508	+ 18.7	18 45 17.94
11	162	79 36 55.4	36 24.3	143.37	0.37	0.006 6946	17.8	18 41 22.02
12	163	80 34 15.6	33 44.4	143.33	0.32	0.006 7363	17.0	18 37 26.11
13	164	81 31 34.9	31 03.5	143.28	− 0.21	0.006 7760	+ 16.3	18 33 30.20
14	165	82 28 53.2	28 21.6	143.24	− 0.11	0.006 8138	15.4	18 29 34.29
15	166	83 26 10.7	25 38.9	143.21	+ 0.02	0.006 8499	14.7	18 25 38.38
16	167	84 23 27.3	22 55.4	143.18	+ 0.15	0.006 8843	+ 14.0	18 21 42.47
17	168	85 20 43.2	20 11.1	143.15	0.28	0.006 9171	13.3	18 17 46.56
18	169	86 17 58.3	17 26.1	143.12	0.39	0.006 9483	12.7	18 13 50.65
19	170	87 15 12.8	14 40.5	143.09	+ 0.51	0.006 9781	+ 12.0	18 09 54.74
20	171	88 12 26.8	11 54.3	143.07	0.61	0.007 0063	11.4	18 05 58.83
21	172	89 09 40.4	09 07.6	143.06	0.68	0.007 0330	10.8	18 02 02.92
22	173	90 06 53.6	06 20.8	143.04	+ 0.73	0.007 0583	+ 10.2	17 58 07.01
23	174	91 04 06.3	03 33.3	143.03	0.75	0.007 0820	9.6	17 54 11.09
24	175	92 01 19.0	00 45.7	143.02	0.74	0.007 1043	8.9	17 50 15.18
25	176	92 58 31.4	57 58.0	143.02	+ 0.72	0.007 1250	+ 8.3	17 46 19.27
26	177	93 55 43.8	55 10.2	143.02	0.65	0.007 1440	7.6	17 42 23.36
27	178	94 52 56.2	52 22.5	143.02	0.57	0.007 1612	6.8	17 38 27.45
28	179	95 50 08.6	49 34.7	143.02	+ 0.46	0.007 1766	+ 6.0	17 34 31.54
29	180	96 47 21.2	46 47.2	143.03	0.35	0.007 1901	5.1	17 30 35.63
30	181	97 44 33.9	43 59.7	143.03	0.22	0.007 2014	4.2	17 26 39.72
31	182	98 41 46.7	41 12.4	143.04	+ 0.09	0.007 2104	+ 3.2	17 22 43.81

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' to the mean equinox of January 0.0ᵈ of the Besselian fictitious year.

Diff. for 1 Hour
— 9.8296ˢ.
(Table II.)

	GREENWICH MEAN TIME.							
	THE MOON'S							
Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′. ″	″	h m	m	d
1	15 57.7	16 05.4	58 28.9	+ 2.34	58 56.9	+ 2.33	20 19.3	+ 2.19	24.6
2	16 12.8	16 19.9	59 24.4	2.23	59 50.5	2.10	21 13.4	2.33	25.6
3	16 26.5	16 32.3	60 14.6	1.89	60 36.0	1.65	22 11.2	2.48	26.6
4	16 37.2	16 41.0	60 53.9	+ 1.33	61 07.9	+ 0.97	23 12.2	+ 2.59	27.6
5	16 43.6	16 44.9	61 17.4	+ 0.59	61 22.0	+ 0.18	☾		28.6
6	16 44.7	16 43.3	61 21.6	− 0.24	61 16.2	− 0.65	0 15.3	2.63	0.2
7	16 40.5	16 36.5	61 05.9	− 1.04	60 51.3	− 1.38	1 18.3	+ 2.59	1.2
8	16 31.4	16 25.5	60 32.7	1.69	60 10.8	1.94	2 19.3	2.47	2.2
9	16 18.8	16 11.6	59 46.2	2.12	59 19.8	2.25	3 16.9	2.32	3.2
10	16 04.0	15 56.4	58 52.2	− 2.33	58 24.0	− 2.35	4 10.7	+ 2.17	4.2
11	15 48.7	15 41.1	57 55.8	2.33	57 28.2	2.26	5 01.1	2.04	5.2
12	15 33.9	15 27.0	57 01.5	2.16	56 36.2	2.04	5 48.8	1.94	6.2
13	15 20.5	15 14.6	56 12.5	− 1.90	55 50.6	− 1.75	6 34.6	+ 1.89	7.2
14	15 09.1	15 04.2	55 30.6	1.58	55 12.7	1.41	7 19.4	1.86	8.2
15	14 59.9	14 56.1	54 56.8	1.24	54 43.0	1.07	8 04.1	1.87	9.2
16	14 52.9	14 50.2	54 31.1	− 0.90	54 21.3	0.74	8 49.2	+ 1.89	10.2
17	14 48.0	14 46.4	54 13.3	0.59	54 07.1	0.44	9 35.0	1.93	11.2
18	14 45.1	14 44.4	54 02.6	0.30	53 59.8	− 0.17	10 21.6	1.96	12.2
19	14 44.0	14 44.0	53 58.4	− 0.05	53 58.5	+ 0.07	11 09.1	+ 1.99	13.2
20	14 44.4	14 45.2	54 00.0	+ 0.18	54 02.9	0.29	11 56.9	1.99	14.2
21	14 46.3	14 47.8	54 07.0	0.40	54 12.5	0.51	12 44.7	1.98	15.2
22	14 49.7	14 51.8	54 19.2	+ 0.61	54 27.2	+ 0.72	13 32.1	+ 1.96	16.2
23	14 54.4	14 57.3	54 36.5	0.83	54 47.1	0.94	14 18.8	1.93	17.2
24	15 00.5	15 04.2	54 59.1	1.06	55 12.5	1.18	15 04.9	1.91	18.2
25	15 08.2	15 12.7	55 27.4	+ 1.30	55 43.7	+ 1.42	15 50.7	+ 1.91	19.2
26	15 17.5	15 22.8	56 01.5	1.55	56 20.8	1.66	16 36.5	1.93	20.2
27	15 28.4	15 34.4	56 41.4	1.77	57 03.2	1.87	17 23.2	1.98	21.2
28	15 40.6	15 47.1	57 26.2	+ 1.96	57 50.1	+ 2.02	18 11.6	+ 2.06	22.2
29	15 53.8	16 00.5	58 14.6	2.05	58 39.3	2.06	19 02.4	2.18	23.2
30	16 07.2	16 13.7	59 03.9	2.02	59 27.7	1.93	19 56.6	2.33	24.2
31	16 19.9	16 25.5	59 50.3	+ 1.80	60 11.0	+ 1.63	20 54.2	+ 2.47	25.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ' "	"
0	0 13 34.17	+2.1796	N. 4 13 47.2	+11.150
1	0 15 45.07	2.1837	4 24 56.0	11.142
2	0 17 56.21	2.1878	4 36 04.3	11.134
3	0 20 07.60	2.1920	4 47 12.1	11.124
4	0 22 19.25	2.1963	4 58 19.2	11.112
5	0 24 31.16	2.2007	5 09 25.6	11.101
6	0 26 43.33	2.2050	5 20 31.3	11.087
7	0 28 55.76	2.2093	5 31 36.1	11.072
8	0 31 08.45	2.2137	5 42 40.0	11.057
9	0 33 21.41	2.2183	5 53 42.9	11.040
10	0 35 34.65	2.2229	6 04 44.8	11.022
11	0 37 48.16	2.2275	6 15 45.5	11.002
12	0 40 01.95	2.2322	6 26 45.0	10.982
13	0 42 16.02	2.2368	6 37 43.3	10.960
14	0 44 30.37	2.2416	6 48 40.2	10.937
15	0 46 45.01	2.2464	6 59 35.7	10.912
16	0 48 59.94	2.2512	7 10 29.7	10.887
17	0 51 15.16	2.2562	7 21 22.1	10.860
18	0 53 30.68	2.2611	7 32 12.9	10.832
19	0 55 46.49	2.2660	7 43 02.0	10.803
20	0 58 02.60	2.2710	7 53 49.3	10.772
21	1 00 19.01	2.2761	8 04 34.7	10.740
22	1 02 35.73	2.2812	8 15 18.1	10.707
23	1 04 52.75	+2.2862	N. 8 25 59.5	+10.672

MONDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 07 10.08	+2.2914	N. 8 36 38.8	+10.637
1	1 09 27.72	2.2966	8 47 15.9	10.599
2	1 11 45.67	2.3018	8 57 50.7	10.560
3	1 14 03.94	2.3072	9 08 23.1	10.520
4	1 16 22.53	2.3124	9 18 53.1	10.479
5	1 18 41.43	2.3177	9 29 20.6	10.437
6	1 21 00.66	2.3231	9 39 45.5	10.392
7	1 23 20.20	2.3284	9 50 07.7	10.347
8	1 25 40.07	2.3339	10 00 27.1	10.299
9	1 28 00.27	2.3394	10 10 43.6	10.251
10	1 30 20.80	2.3449	10 20 57.2	10.202
11	1 32 41.66	2.3503	10 31 07.8	10.150
12	1 35 02.84	2.3558	10 41 15.2	10.097
13	1 37 24.36	2.3614	10 51 19.4	10.043
14	1 39 46.21	2.3669	11 01 20.4	9.987
15	1 42 08.39	2.3725	11 11 17.9	9.930
16	1 44 30.91	2.3782	11 21 12.0	9.872
17	1 46 53.77	2.3837	11 31 02.5	9.812
18	1 49 16.96	2.3893	11 40 49.4	9.750
19	1 51 40.49	2.3950	11 50 32.5	9.687
20	1 54 04.36	2.4006	12 00 11.8	9.622
21	1 56 28.56	2.4062	12 09 47.2	9.557
22	1 58 53.11	2.4119	12 19 18.6	9.489
23	2 01 17.99	2.4176	12 28 45.9	9.420
24	2 03 43.22	+2.4233	N.12 38 09.0	+9.349

TUESDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ' "	"
0	2 03 43.22	+2.4233	N.12 38 09.0	+9.349
1	2 06 08.79	2.4289	12 47 27.8	9.272
2	2 08 34.69	2.4346	12 56 42.2	9.203
3	2 11 00.94	2.4403	13 05 52.2	9.128
4	2 13 27.53	2.4459	13 14 57.6	9.052
5	2 15 54.45	2.4515	13 23 58.4	8.973
6	2 18 21.71	2.4572	13 32 54.4	8.893
7	2 20 49.31	2.4628	13 41 45.6	8.812
8	2 23 17.25	2.4685	13 50 31.9	8.729
9	2 25 45.53	2.4741	13 59 13.1	8.645
10	2 28 14.14	2.4796	14 07 49.3	8.560
11	2 30 43.08	2.4852	14 16 20.3	8.472
12	2 33 12.36	2.4907	14 24 46.0	8.383
13	2 35 41.97	2.4962	14 33 06.3	8.292
14	2 38 11.91	2.5017	14 41 21.1	8.201
15	2 40 42.18	2.5072	14 49 30.4	8.107
16	2 43 12.78	2.5127	14 57 34.0	8.012
17	2 45 43.70	2.5180	15 05 31.9	7.917
18	2 48 14.94	2.5233	15 13 24.0	7.819
19	2 50 46.50	2.5287	15 21 10.2	7.720
20	2 53 18.38	2.5340	15 28 50.4	7.619
21	2 55 50.58	2.5392	15 36 24.5	7.517
22	2 58 23.09	2.5444	15 43 52.4	7.413
23	3 00 55.91	+2.5496	N.15 51 14.1	+7.308

WEDNESDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 03 29.04	+2.5547	N.15 58 29.4	+7.202
1	3 06 02.47	2.5597	16 05 38.3	7.094
2	3 08 36.20	2.5647	16 12 40.7	6.985
3	3 11 10.23	2.5696	16 19 36.5	6.875
4	3 13 44.55	2.5744	16 26 25.7	6.763
5	3 16 19.16	2.5792	16 33 08.1	6.649
6	3 18 54.06	2.5840	16 39 43.6	6.535
7	3 21 29.24	2.5887	16 46 12.3	6.419
8	3 24 04.70	2.5932	16 52 33.9	6.302
9	3 26 40.43	2.5977	16 58 48.5	6.183
10	3 29 16.43	2.6022	17 04 55.9	6.063
11	3 31 52.70	2.6066	17 10 56.1	5.942
12	3 34 29.22	2.6108	17 16 49.0	5.820
13	3 37 06.00	2.6151	17 22 34.5	5.697
14	3 39 43.03	2.6192	17 28 12.6	5.572
15	3 42 20.31	2.6232	17 33 43.1	5.446
16	3 44 57.82	2.6272	17 39 06.1	5.319
17	3 47 35.57	2.6310	17 44 21.4	5.191
18	3 50 13.54	2.6347	17 49 29.0	5.062
19	3 52 51.74	2.6385	17 54 28.8	4.931
20	3 55 30.16	2.6420	17 59 20.7	4.799
21	3 58 08.78	2.6454	18 04 04.7	4.667
22	4 00 47.61	2.6488	18 08 40.8	4.535
23	4 03 26.64	2.6521	18 13 08.9	4.400
24	4 06 05.86	+2.6552	N.18 17 28.8	+4.264

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 5.					**SATURDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 06 05.86	+ 2.6552	N.18 17 28.8	+ 4.264	0	6 14 49.12	+ 2.6578	N.18 56 19.1	− 2.680
1	4 08 45.27	2.6582	18 21 40.6	4.127	1	6 17 28.50	2.6547	18 53 34.1	2.820
2	4 11 24.85	2.6612	18 25 44.1	3.990	2	6 20 07.69	2.6515	18 50 40.7	2.959
3	4 14 04.61	2.6640	18 29 39.4	3.852	3	6 22 46.68	2.6482	18 47 39.0	3.097
4	4 16 44.53	2.6667	18 33 26.4	3.714	4	6 25 25.47	2.6447	18 44 29.1	3.234
5	4 19 24.61	2.6692	18 37 05.1	3.575	5	6 28 04.05	2.6412	18 41 10.9	3.371
6	4 22 04.84	2.6717	18 40 35.4	3.434	6	6 30 42.42	2.6376	18 37 44.6	3.506
7	4 24 45.22	2.6742	18 43 57.2	3.293	7	6 33 20.56	2.6338	18 34 10.2	3.641
8	4 27 25.74	2.6763	18 47 10.6	3.152	8	6 35 58.48	2.6300	18 30 27.7	3.775
9	4 30 06.38	2.6784	18 50 15.4	3.009	9	6 38 36.16	2.6261	18 26 37.2	3.907
10	4 32 47.15	2.6804	18 53 11.7	2.867	10	6 41 13.61	2.6221	18 22 38.8	4.038
11	4 35 28.03	2.6822	18 55 59.4	2.723	11	6 43 50.81	2.6179	18 18 32.6	4.169
12	4 38 09.02	2.6840	18 58 38.4	2.578	12	6 46 27.76	2.6137	18 14 18.5	4.299
13	4 40 50.11	2.6856	19 01 08.8	2.433	13	6 49 04.45	2.6092	18 09 56.7	4.427
14	4 43 31.29	2.6871	19 03 30.4	2.287	14	6 51 40.87	2.6048	18 05 27.2	4.555
15	4 46 12.56	2.6884	19 05 43.3	2.142	15	6 54 17.03	2.6003	18 00 50.1	4.682
16	4 48 53.90	2.6896	19 07 47.5	1.997	16	6 56 52.91	2.5958	17 56 05.4	4.807
17	4 51 35.31	2.6907	19 09 43.0	1.851	17	6 59 28.52	2.5912	17 51 13.3	4.931
18	4 54 16.78	2.6916	19 11 29.6	1.704	18	7 02 03.85	2.5864	17 46 13.7	5.054
19	4 56 58.30	2.6924	19 13 07.4	1.557	19	7 04 38.89	2.5816	17 41 06.8	5.176
20	4 59 39.87	2.6931	19 14 36.4	1.409	20	7 07 13.64	2.5767	17 35 52.6	5.297
21	5 02 21.47	2.6936	19 15 56.5	1.262	21	7 09 48.09	2.5717	17 30 31.2	5.416
22	5 05 03.10	2.6941	19 17 07.8	1.114	22	7 12 22.24	2.5666	17 25 02.7	5.534
23	5 07 44.76	+ 2.6944	N.19 18 10.2	+ 0.966	23	7 14 56.08	+ 2.5615	N.17 19 27.1	− 5.651
	FRIDAY 6.					**SUNDAY 8.**			
0	5 10 26.43	+ 2.6945	N.19 19 03.7	+ 0.817	0	7 17 29.62	+ 2.5564	N.17 13 44.6	− 5.766
1	5 13 08.10	2.6945	19 19 48.3	0.670	1	7 20 02.85	2.5512	17 07 55.2	5.880
2	5 15 49.77	2.6943	19 20 24.1	0.521	2	7 22 35.76	2.5458	17 01 59.0	5.993
3	5 18 31.42	2.6940	19 20 50.9	0.373	3	7 25 08.35	2.5405	16 55 56.0	6.106
4	5 21 13.05	2.6936	19 21 08.9	0.225	4	7 27 40.62	2.5351	16 49 46.3	6.216
5	5 23 54.65	2.6931	19 21 17.9	+ 0.077	5	7 30 12.56	2.5296	16 43 30.1	6.325
6	5 26 36.22	2.6924	19 21 18.1	− 0.071	6	7 32 44.17	2.5241	16 37 07.3	6.433
7	5 29 17.74	2.6916	19 21 09.4	0.219	7	7 35 15.45	2.5186	16 30 38.1	6.539
8	5 31 59.21	2.6907	19 20 51.8	0.367	8	7 37 46.40	2.5130	16 24 02.6	6.644
9	5 34 40.62	2.6896	19 20 25.4	0.514	9	7 40 17.01	2.5073	16 17 20.8	6.748
10	5 37 21.96	2.6884	19 19 50.1	0.662	10	7 42 47.28	2.5017	16 10 32.8	6.851
11	5 40 03.23	2.6871	19 19 06.0	0.809	11	7 45 17.21	2.4960	16 03 38.7	6.952
12	5 42 44.41	2.6856	19 18 13.0	0.957	12	7 47 46.80	2.4902	15 56 38.6	7.051
13	5 45 25.50	2.6839	19 17 11.2	1.103	13	7 50 16.04	2.4844	15 49 32.6	7.149
14	5 48 06.48	2.6822	19 16 00.7	1.248	14	7 52 44.93	2.4786	15 42 20.7	7.247
15	5 50 47.36	2.6803	19 14 41.4	1.394	15	7 55 13.47	2.4727	15 35 03.0	7.342
16	5 53 28.12	2.6783	19 13 13.4	1.539	16	7 57 41.66	2.4669	15 27 39.7	7.435
17	5 56 08.76	2.6762	19 11 36.7	1.684	17	8 00 09.50	2.4611	15 20 10.8	7.527
18	5 58 49.26	2.6739	19 09 51.3	1.828	18	8 02 36.99	2.4552	15 12 36.4	7.619
19	6 01 29.63	2.6716	19 07 57.3	1.972	19	8 05 04.12	2.4492	15 04 56.5	7.709
20	6 04 09.85	2.6691	19 05 54.7	2.114	20	8 07 30.89	2.4432	14 57 11.3	7.797
21	6 06 49.92	2.6664	19 03 43.6	2.257	21	8 09 57.31	2.4373	14 49 20.8	7.884
22	6 09 29.82	2.6637	19 01 23.9	2.399	22	8 12 23.37	2.4313	14 41 25.2	7.969
23	6 12 09.56	2.6608	18 58 55.7	2.540	23	8 14 49.07	2.4253	14 33 24.5	8.053
24	6 14 49.12	+ 2.6578	N.18 56 19.1	− 2.680	24	8 17 14.41	+ 2.4193	N.14 25 18.8	− 8.136

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 9.					**WEDNESDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 17 14.41	+ 2.4193	N.14 25 18.8	− 8.136	0	10 06 44.58	+ 2.1553	N. 6 45 31.3	−10.530
1	8 19 39.39	2.4133	14 17 08.2	8.217	1	10 08 53.76	2.1508	6 34 58.9	10.550
2	8 22 04.01	2.4073	14 08 52.7	8.297	2	10 11 02.68	2.1463	6 24 25.3	10.570
3	8 24 28.27	2.4014	14 00 32.5	8.376	3	10 13 11.32	2.1419	6 13 50.5	10.588
4	8 26 52.18	2.3954	13 52 07.6	8.452	4	10 15 19.71	2.1376	6 03 14.7	10.605
5	8 29 15.72	2.3893	13 43 38.2	8.527	5	10 17 27.83	2.1332	5 52 37.9	10.621
6	8 31 38.90	2.3833	13 35 04.3	8.602	6	10 19 35.70	2.1290	5 42 00.2	10.636
7	8 34 01.72	2.3773	13 26 25.9	8.676	7	10 21 43.31	2.1248	5 31 21.6	10.651
8	8 36 24.18	2.3714	13 17 43.2	8.747	8	10 23 50.67	2.1207	5 20 42.1	10.664
9	8 38 46.29	2.3655	13 08 56.3	8.817	9	10 25 57.79	2.1166	5 10 01.9	10.676
10	8 41 08.04	2.3595	13 00 05.2	8.886	10	10 28 04.66	2.1125	4 59 21.0	10.687
11	8 43 29.43	2.3536	12 51 10.0	8.952	11	10 30 11.29	2.1085	4 48 39.4	10.697
12	8 45 50.47	2.3477	12 42 10.9	9.018	12	10 32 17.68	2.1046	4 37 57.3	10.706
13	8 48 11.15	2.3417	12 33 07.8	9.082	13	10 34 23.84	2.1007	4 27 14.7	10.715
14	8 50 31.48	2.3358	12 24 01.0	9.145	14	10 36 29.77	2.0969	4 16 31.5	10.723
15	8 52 51.45	2.3299	12 14 50.4	9.207	15	10 38 35.47	2.0932	4 05 47.9	10.729
16	8 55 11.07	2.3241	12 05 36.1	9.268	16	10 40 40.95	2.0896	3 55 04.0	10.734
17	8 57 30.34	2.3182	11 56 18.2	9.327	17	10 42 46.22	2.0859	3 44 19.8	10.739
18	8 59 49.26	2.3125	11 46 56.9	9.384	18	10 44 51.26	2.0822	3 33 35.3	10.743
19	9 02 07.84	2.3067	11 37 32.1	9.441	19	10 46 56.09	2.0787	3 22 50.6	10.746
20	9 04 26.07	2.3009	11 28 04.0	9.496	20	10 49 00.71	2.0752	3 12 05.8	10.748
21	9 06 43.95	2.2952	11 18 32.6	9.549	21	10 51 05.12	2.0718	3 01 20.8	10.750
22	9 09 01.49	2.2895	11 08 58.1	9.601	22	10 53 09.33	2.0685	2 50 35.8	10.750
23	9 11 18.69	+ 2.2838	N.10 59 20.5	− 9.652	23	10 55 13.34	+ 2.0652	N. 2 39 50.8	−10.749
	TUESDAY 10.					**THURSDAY 12.**			
0	9 13 35.55	+ 2.2782	N.10 49 39.8	− 9.702	0	10 57 17.16	+ 2.0621	N. 2 29 05.9	−10.747
1	9 15 52.07	2.2726	10 39 56.2	9.751	1	10 59 20.79	2.0588	2 18 21.1	10.746
2	9 18 08.26	2.2671	10 30 09.7	9.797	2	11 01 24.22	2.0557	2 07 36.4	10.742
3	9 20 24.12	2.2615	10 20 20.5	9.842	3	11 03 27.47	2.0527	1 56 52.0	10.738
4	9 22 39.64	2.2560	10 10 28.6	9.887	4	11 05 30.54	2.0497	1 46 07.8	10.734
5	9 24 54.84	2.2506	10 00 34.0	9.932	5	11 07 33.43	2.0467	1 35 23.9	10.729
6	9 27 09.71	2.2452	9 50 36.8	9.973	6	11 09 36.15	2.0438	1 24 40.3	10.725
7	9 29 24.26	2.2398	9 40 37.2	10.014	7	11 11 38.69	2.0410	1 13 57.2	10.715
8	9 31 38.49	2.2345	9 30 35.1	10.054	8	11 13 41.07	2.0382	1 03 14.5	10.707
9	9 33 52.40	2.2292	9 20 30.7	10.092	9	11 15 43.28	2.0354	0 52 32.3	10.699
10	9 36 05.99	2.2239	9 10 24.0	10.130	10	11 17 45.32	2.0327	0 41 50.6	10.690
11	9 38 19.27	2.2187	9 00 15.1	10.166	11	11 19 47.21	2.0302	0 31 09.5	10.680
12	9 40 32.23	2.2135	8 50 04.1	10.201	12	11 21 48.95	2.0277	0 20 29.0	10.669
13	9 42 44.89	2.2084	8 39 51.0	10.234	13	11 23 50.54	2.0252	N. 0 09 49.2	10.657
14	9 44 57.24	2.2033	8 29 36.0	10.267	14	11 25 51.98	2.0227	S. 0 00 49.9	10.645
15	9 47 09.29	2.1983	8 19 19.0	10.298	15	11 27 53.27	2.0203	0 11 28.2	10.632
16	9 49 21.04	2.1933	8 09 00.2	10.328	16	11 29 54.42	2.0180	0 22 05.7	10.617
17	9 51 32.49	2.1884	7 58 39.6	10.357	17	11 31 55.43	2.0157	0 32 42.3	10.603
18	9 53 43.65	2.1835	7 48 17.3	10.385	18	11 33 56.31	2.0136	0 43 18.1	10.588
19	9 55 54.51	2.1787	7 37 53.4	10.412	19	11 35 57.06	2.0114	0 53 52.9	10.572
20	9 58 05.09	2.1739	7 27 27.8	10.438	20	11 37 57.68	2.0093	1 04 26.7	10.555
21	10 00 15.38	2.1692	7 17 00.8	10.462	21	11 39 58.18	2.0073	1 14 59.5	10.538
22	10 02 25.39	2.1645	7 06 32.3	10.486	22	11 41 58.56	2.0053	1 25 31.3	10.521
23	10 04 35.12	2.1599	6 56 02.5	10.508	23	11 43 58.82	2.0034	1 36 02.0	10.502
24	10 06 44.58	+ 2.1553	N. 6 45 31.3	−10.530	24	11 45 58.97	+ 2.0015	S. 1 46 31.5	−10.482

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
FRIDAY 13.					**SUNDAY 15.**				
0	11 45 58.97	+ 2.0015	S. 1 46 31.5	− 10.482	0	13 20 51.70	+ 1.9696	S. 9 35 30.3	− 8.837
1	11 47 59.00	1.9997	1 56 59.8	10.462	1	13 22 49.89	1.9700	9 44 19.1	8.789
2	11 49 58.93	1.9980	2 07 26.9	10.442	2	13 24 48.10	1.9704	9 53 05.0	8.741
3	11 51 58.76	1.9962	2 17 52.8	10.420	3	13 26 46.34	1.9708	10 01 48.0	8.692
4	11 53 58.48	1.9945	2 28 17.3	10.397	4	13 28 44.60	1.9713	10 10 28.0	8.642
5	11 55 58.10	1.9929	2 38 40.5	10.375	5	13 30 42.90	1.9719	10 19 05.1	8.592
6	11 57 57.63	1.9914	2 49 02.3	10.352	6	13 32 41.23	1.9724	10 27 39.1	8.542
7	11 59 57.07	1.9899	2 59 22.7	10.327	7	13 34 39.59	1.9730	10 36 10.1	8.492
8	12 01 56.42	1.9884	3 09 41.6	10.303	8	13 36 37.99	1.9737	10 44 38.1	8.440
9	12 03 55.68	1.9870	3 19 59.1	10.278	9	13 38 36.43	1.9743	10 53 02.9	8.387
10	12 05 54.86	1.9857	3 30 15.0	10.252	10	13 40 34.91	1.9749	11 01 24.6	8.336
11	12 07 53.96	1.9844	3 40 29.3	10.225	11	13 42 33.42	1.9756	11 09 43.2	8.283
12	12 09 52.99	1.9832	3 50 42.0	10.198	12	13 44 31.98	1.9764	11 17 58.6	8.230
13	12 11 51.94	1.9820	4 00 53.1	10.171	13	13 46 30.59	1.9772	11 26 10.8	8.176
14	12 13 50.83	1.9809	4 11 02.5	10.142	14	13 48 29.24	1.9780	11 34 19.7	8.121
15	12 15 49.65	1.9797	4 21 10.2	10.113	15	13 50 27.95	1.9788	11 42 25.3	8.066
16	12 17 48.40	1.9787	4 31 16.1	10.083	16	13 52 26.70	1.9796	11 50 27.6	8.011
17	12 19 47.09	1.9777	4 41 20.2	10.053	17	13 54 25.50	1.9805	11 58 26.6	7.955
18	12 21 45.73	1.9768	4 51 22.5	10.022	18	13 56 24.36	1.9814	12 06 22.2	7.898
19	12 23 44.31	1.9759	5 01 22.9	9.991	19	13 58 23.27	1.9823	12 14 14.4	7.842
20	12 25 42.84	1.9751	5 11 21.4	9.959	20	14 00 22.24	1.9833	12 22 03.2	7.784
21	12 27 41.32	1.9742	5 21 18.0	9.927	21	14 02 21.27	1.9843	12 29 48.5	7.727
22	12 29 39.75	1.9735	5 31 12.6	9.893	22	14 04 20.36	1.9852	12 37 30.4	7.669
23	12 31 38.14	+ 1.9728	S. 5 41 05.2	− 9.860	23	14 06 19.50	+ 1.9862	S.12 45 08.8	− 7.610
SATURDAY 14.					**MONDAY 16.**				
0	12 33 36.49	+ 1.9722	S. 5 50 55.8	− 9.826	0	14 08 18.71	+ 1.9873	S.12 52 43.6	− 7.550
1	12 35 34.80	1.9716	6 00 44.3	9.791	1	14 10 17.98	1.9884	13 00 14.8	7.491
2	12 37 33.08	1.9711	6 10 30.7	9.755	2	14 12 17.32	1.9896	13 07 42.5	7.431
3	12 39 31.33	1.9705	6 20 14.9	9.719	3	14 14 16.73	1.9907	13 15 06.5	7.369
4	12 41 29.54	1.9700	6 29 57.0	9.683	4	14 16 16.20	1.9917	13 22 26.8	7.308
5	12 43 27.73	1.9697	6 39 36.9	9.646	5	14 18 15.74	1.9929	13 29 43.5	7.247
6	12 45 25.90	1.9692	6 49 14.5	9.607	6	14 20 15.35	1.9941	13 36 56.5	7.185
7	12 47 24.04	1.9689	6 58 49.8	9.569	7	14 22 15.03	1.9952	13 44 05.7	7.122
8	12 49 22.17	1.9687	7 08 22.8	9.531	8	14 24 14.78	1.9965	13 51 11.2	7.060
9	12 51 20.28	1.9683	7 17 53.5	9.492	9	14 26 14.61	1.9977	13 58 12.9	6.996
10	12 53 18.37	1.9682	7 27 21.8	9.452	10	14 28 14.51	1.9989	14 05 10.7	6.932
11	12 55 16.46	1.9681	7 36 47.7	9.411	11	14 30 14.48	2.0002	14 12 04.7	6.867
12	12 57 14.54	1.9679	7 46 11.1	9.370	12	14 32 14.53	2.0015	14 18 54.8	6.802
13	12 59 12.61	1.9678	7 55 32.1	9.329	13	14 34 14.66	2.0027	14 25 41.0	6.737
14	13 01 10.68	1.9678	8 04 50.6	9.287	14	14 36 14.86	2.0040	14 32 23.3	6.672
15	13 03 08.75	1.9678	8 14 06.5	9.244	15	14 38 15.14	2.0053	14 39 01.6	6.606
16	13 05 06.82	1.9678	8 23 19.9	9.201	16	14 40 15.50	2.0067	14 45 36.0	6.539
17	13 07 04.89	1.9679	8 32 30.6	9.157	17	14 42 15.94	2.0080	14 52 06.3	6.472
18	13 09 02.97	1.9681	8 41 38.7	9.113	18	14 44 16.46	2.0093	14 58 32.6	6.404
19	13 11 01.06	1.9682	8 50 44.2	9.068	19	14 46 17.06	2.0107	15 04 54.8	6.336
20	13 12 59.16	1.9684	8 59 46.9	9.022	20	14 48 17.74	2.0120	15 11 12.9	6.267
21	13 14 57.27	1.9687	9 08 46.9	8.977	21	14 50 18.50	2.0133	15 17 26.9	6.198
22	13 16 55.40	1.9689	9 17 44.2	8.932	22	14 52 19.34	2.0147	15 23 36.7	6.129
23	13 18 53.54	1.9692	9 26 38.7	8.884	23	14 54 20.27	2.0162	15 29 42.4	6.060
24	13 20 51.70	+ 1.9696	S. 9 35 30.3	− 8.837	24	14 56 21.28	+ 2.0176	S.15 35 43.9	− 5.990

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 17.					**THURSDAY 19.**			
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 56 21.28	+ 2.0176	S.15 35 43.9	− 5.990	0	16 34 45.89	+ 2.0792	S.18 55 01.2	− 2.185
1	14 58 22.38	2.0190	15 41 41.2	5.919	1	16 36 50.67	2.0801	18 57 09.7	2.098
2	15 00 23.56	2.0203	15 47 34.2	5.847	2	16 38 55.50	2.0809	18 59 13.0	2.012
3	15 02 24.82	2.0217	15 53 22.9	5.776	3	16 41 00.38	2.0818	19 01 11.1	1.925
4	15 04 26.17	2.0232	15 59 07.3	5.704	4	16 43 05.32	2.0827	19 03 04.0	1.837
5	15 06 27.60	2.0245	16 04 47.4	5.632	5	16 45 10.31	2.0836	19 04 51.6	1.750
6	15 08 29.11	2.0259	16 10 23.2	5.559	6	16 47 15.35	2.0843	19 06 34.0	1.663
7	15 10 30.71	2.0274	16 15 54.5	5.486	7	16 49 20.43	2.0851	19 08 11.2	1.576
8	15 12 32.40	2.0288	16 21 21.5	5.413	8	16 51 25.56	2.0859	19 09 43.1	1.487
9	15 14 34.17	2.0302	16 26 44.1	5.339	9	16 53 30.74	2.0867	19 11 09.7	1.400
10	15 16 36.03	2.0317	16 32 02.2	5.265	10	16 55 35.96	2.0873	19 12 31.1	1.312
11	15 18 37.97	2.0331	16 37 15.9	5.190	11	16 57 41.22	2.0880	19 13 47.1	1.223
12	15 20 40.00	2.0346	16 42 25.0	5.114	12	16 59 46.52	2.0887	19 14 57.9	1.136
13	15 22 42.12	2.0360	16 47 29.6	5.039	13	17 01 51.86	2.0893	19 16 03.4	1.047
14	15 24 44.32	2.0373	16 52 29.7	4.964	14	17 03 57.24	2.0899	19 17 03.5	0.958
15	15 26 46.60	2.0387	16 57 25.3	4.887	15	17 06 02.65	2.0905	19 17 58.4	0.870
16	15 28 48.97	2.0402	17 02 16.2	4.810	16	17 08 08.10	2.0911	19 18 47.9	0.780
17	15 30 51.42	2.0415	17 07 02.5	4.733	17	17 10 13.58	2.0916	19 19 32.0	0.692
18	15 32 53.95	2.0429	17 11 44.2	4.657	18	17 12 19.09	2.0920	19 20 10.9	0.603
19	15 34 56.57	2.0443	17 16 21.3	4.578	19	17 14 24.62	2.0924	19 20 44.4	0.513
20	15 36 59.27	2.0457	17 20 53.6	4.500	20	17 16 30.18	2.0929	19 21 12.5	0.424
21	15 39 02.06	2.0471	17 25 21.3	4.422	21	17 18 35.77	2.0933	19 21 35.3	0.335
22	15 41 04.92	2.0484	17 29 44.3	4.343	22	17 20 41.38	2.0937	19 21 52.7	0.246
23	15 43 07.87	+ 2.0497	S.17 34 02.5	− 4.263	23	17 22 47.02	+ 2.0941	S.19 22 04.8	− 0.157
	WEDNESDAY 18.					**FRIDAY 20.**			
0	15 45 10.89	+ 2.0511	S.17 38 15.9	− 4.184	0	17 24 52.67	+ 2.0943	S.19 22 11.5	− 0.067
1	15 47 14.00	2.0525	17 42 24.6	4.104	1	17 26 58.34	2.0947	19 22 12.8	+ 0.022
2	15 49 17.19	2.0538	17 46 28.4	4.024	2	17 29 04.03	2.0949	19 22 08.8	0.112
3	15 51 20.46	2.0552	17 50 27.5	3.944	3	17 31 09.73	2.0952	19 21 59.4	0.202
4	15 53 23.81	2.0564	17 54 21.7	3.862	4	17 33 15.45	2.0953	19 21 44.6	0.291
5	15 55 27.23	2.0577	17 58 11.0	3.782	5	17 35 21.17	2.0955	19 21 24.5	0.380
6	15 57 30.73	2.0590	18 01 55.5	3.701	6	17 37 26.91	2.0957	19 20 59.0	0.470
7	15 59 34.31	2.0602	18 05 35.1	3.619	7	17 39 32.65	2.0957	19 20 28.1	0.560
8	16 01 37.96	2.0615	18 09 09.8	3.537	8	17 41 38.40	2.0958	19 19 51.8	0.650
9	16 03 41.69	2.0627	18 12 39.5	3.453	9	17 43 44.15	2.0959	19 19 10.1	0.739
10	16 05 45.49	2.0640	18 16 04.2	3.371	10	17 45 49.91	2.0960	19 18 23.1	0.828
11	16 07 49.37	2.0652	18 19 24.0	3.288	11	17 47 55.67	2.0959	19 17 30.7	0.918
12	16 09 53.32	2.0664	18 22 38.8	3.205	12	17 50 01.42	2.0958	19 16 32.9	1.007
13	16 11 57.34	2.0676	18 25 48.6	3.122	13	17 52 07.17	2.0958	19 15 29.8	1.097
14	16 14 01.43	2.0687	18 28 53.4	3.037	14	17 54 12.92	2.0957	19 14 21.3	1.187
15	16 16 05.59	2.0698	18 31 53.1	2.952	15	17 56 18.66	2.0957	19 13 07.4	1.276
16	16 18 09.81	2.0709	18 34 47.7	2.868	16	17 58 24.40	2.0955	19 11 48.2	1.364
17	16 20 14.10	2.0721	18 37 37.3	2.784	17	18 00 30.12	2.0952	19 10 23.7	1.453
18	16 22 18.46	2.0732	18 40 21.8	2.699	18	18 02 35.83	2.0951	19 08 53.8	1.543
19	16 24 22.88	2.0742	18 43 01.2	2.614	19	18 04 41.53	2.0949	19 07 18.5	1.632
20	16 26 27.36	2.0752	18 45 35.5	2.528	20	18 06 47.22	2.0947	19 05 37.9	1.721
21	16 28 31.90	2.0762	18 48 04.6	2.442	21	18 08 52.89	2.0943	19 03 52.0	1.809
22	16 30 36.51	2.0772	18 50 28.6	2.357	22	18 10 58.54	2.0940	19 02 00.8	1.897
23	16 32 41.17	2.0782	18 52 47.5	2.272	23	18 13 04.17	2.0937	19 00 04.3	1.986
24	16 34 45.89	+ 2.0792	S.18 55 01.2	− 2.185	24	18 15 09.78	+ 2.0933	S.18 58 02.5	+ 2.074

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 21.					**MONDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 15 09.78	+ 2.0933	S.18 58 02.5	+ 2.074	0	19 54 48.40	+ 2.0526	S.15 40 52.0	+ 6.027
1	18 17 15.37	2.0929	18 55 55.4	2.162	1	19 56 51.52	2.0514	15 34 48.2	6.100
2	18 19 20.93	2.0925	18 53 43.0	2.251	2	19 58 54.57	2.0503	15 28 40.0	6.173
3	18 21 26.47	2.0921	18 51 25.3	2.339	3	20 00 57.56	2.0492	15 22 27.4	6.247
4	18 23 31.98	2.0916	18 49 02.3	2.427	4	20 03 00.48	2.0481	15 16 10.4	6.319
5	18 25 37.46	2.0911	18 46 34.1	2.513	5	20 05 03.33	2.0470	15 09 49.1	6.391
6	18 27 42.91	2.0906	18 44 00.7	2.601	6	20 07 06.12	2.0459	15 03 23.5	6.462
7	18 29 48.33	2.0900	18 41 22.0	2.688	7	20 09 08.84	2.0447	14 56 53.6	6.534
8	18 31 53.71	2.0894	18 38 38.1	2.776	8	20 11 11.49	2.0436	14 50 19.4	6.605
9	18 33 59.06	2.0888	18 35 48.9	2.862	9	20 13 14.07	2.0425	14 43 41.0	6.675
10	18 36 04.37	2.0882	18 32 54.6	2.949	10	20 15 16.59	2.0415	14 36 58.4	6.745
11	18 38 09.65	2.0877	18 29 55.0	3.036	11	20 17 19.05	2.0404	14 30 11.6	6.814
12	18 40 14.89	2.0870	18 26 50.3	3.122	12	20 19 21.44	2.0393	14 23 20.7	6.883
13	18 42 20.09	2.0862	18 23 40.4	3.207	13	20 21 23.77	2.0382	14 16 25.6	6.952
14	18 44 25.24	2.0856	18 20 25.4	3.293	14	20 23 26.03	2.0372	14 09 26.5	7.019
15	18 46 30.36	2.0849	18 17 05.2	3.379	15	20 25 28.23	2.0362	14 02 23.3	7.087
16	18 48 35.43	2.0841	18 13 39.9	3.463	16	20 27 30.37	2.0351	13 55 16.0	7.154
17	18 50 40.45	2.0832	18 10 09.6	3.548	17	20 29 32.44	2.0340	13 48 04.8	7.220
18	18 52 45.42	2.0825	18 06 34.1	3.634	18	20 31 34.45	2.0330	13 40 49.6	7.287
19	18 54 50.35	2.0817	18 02 53.5	3.718	19	20 33 36.40	2.0320	13 33 30.4	7.352
20	18 56 55.23	2.0809	17 59 07.9	3.802	20	20 35 38.29	2.0311	13 26 07.3	7.417
21	18 59 00.06	2.0801	17 55 17.2	3.887	21	20 37 40.13	2.0301	13 18 40.4	7.481
22	19 01 04.84	2.0792	17 51 21.4	3.971	22	20 39 41.90	2.0291	13 11 09.6	7.546
23	19 03 09.57	+ 2.0783	S.17 47 20.7	+ 4.053	23	20 41 43.62	+ 2.0282	S.13 03 34.9	+ 7.609
	SUNDAY 22.					**TUESDAY 24.**			
0	19 05 14.24	+ 2.0774	S.17 43 15.0	+ 4.137	0	20 43 45.28	+ 2.0272	S.12 55 56.5	+ 7.672
1	19 07 18.86	2.0765	17 39 04.3	4.219	1	20 45 46.88	2.0262	12 48 14.3	7.734
2	19 09 23.42	2.0756	17 34 48.7	4.302	2	20 47 48.43	2.0254	12 40 28.4	7.796
3	19 11 27.93	2.0747	17 30 28.1	4.384	3	20 49 49.93	2.0246	12 32 38.8	7.857
4	19 13 32.38	2.0737	17 26 02.6	4.466	4	20 51 51.38	2.0237	12 24 45.5	7.918
5	19 15 36.77	2.0727	17 21 32.2	4.547	5	20 53 52.77	2.0227	12 16 48.6	7.979
6	19 17 41.10	2.0717	17 16 56.9	4.628	6	20 55 54.11	2.0219	12 08 48.0	8.039
7	19 19 45.38	2.0707	17 12 16.8	4.709	7	20 57 55.40	2.0212	12 00 43.9	8.097
8	19 21 49.59	2.0697	17 07 31.8	4.790	8	20 59 56.65	2.0203	11 52 36.3	8.157
9	19 23 53.74	2.0687	17 02 42.0	4.870	9	21 01 57.84	2.0195	11 44 25.1	8.215
10	19 25 57.83	2.0677	16 57 47.4	4.950	10	21 03 58.99	2.0188	11 36 10.5	8.272
11	19 28 01.86	2.0667	16 52 48.0	5.029	11	21 06 00.10	2.0181	11 27 52.4	8.330
12	19 30 05.83	2.0656	16 47 43.9	5.107	12	21 08 01.16	2.0173	11 19 30.9	8.387
13	19 32 09.73	2.0645	16 42 35.1	5.187	13	21 10 02.18	2.0167	11 11 06.0	8.442
14	19 34 13.57	2.0635	16 37 21.5	5.265	14	21 12 03.16	2.0160	11 02 37.8	8.497
15	19 36 17.35	2.0624	16 32 03.3	5.342	15	21 14 04.10	2.0153	10 54 06.3	8.552
16	19 38 21.06	2.0613	16 26 40.4	5.421	16	21 16 05.00	2.0147	10 45 31.5	8.607
17	19 40 24.71	2.0602	16 21 12.8	5.498	17	21 18 05.87	2.0142	10 36 53.5	8.661
18	19 42 28.29	2.0592	16 15 40.6	5.574	18	21 20 06.71	2.0137	10 28 12.2	8.714
19	19 44 31.81	2.0581	16 10 03.9	5.650	19	21 22 07.51	2.0131	10 19 27.8	8.767
20	19 46 35.26	2.0569	16 04 22.6	5.727	20	21 24 08.28	2.0126	10 10 40.2	8.819
21	19 48 38.64	2.0558	15 58 36.7	5.802	21	21 26 09.02	2.0122	10 01 49.5	8.871
22	19 50 41.96	2.0547	15 52 46.3	5.877	22	21 28 09.74	2.0117	9 52 55.7	8.922
23	19 52 45.21	2.0537	15 46 51.4	5.952	23	21 30 10.43	2.0112	9 43 58.9	8.972
24	19 54 48.40	+ 2.0526	S.15 40 52.0	+ 6.027	24	21 32 11.09	+ 2.0108	S. 9 34 59.1	+ 9.022

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ' "	"
0	21 32 11.09	+ 2.0108	S. 9 34 59.1	+ 9.022
1	21 34 11.73	2.0106	9 25 56.3	9.071
2	21 36 12.36	2.0102	9 16 50.6	9.119
3	21 38 12.96	2.0099	9 07 42.0	9.167
4	21 40 13.55	2.0097	8 58 30.5	9.215
5	21 42 14.13	2.0095	8 49 16.2	9.262
6	21 44 14.69	2.0092	8 39 59.1	9.308
7	21 46 15.24	2.0091	8 30 39.2	9.354
8	21 48 15.78	2.0090	8 21 16.6	9.399
9	21 50 16.32	2.0090	8 11 51.3	9.443
10	21 52 16.86	2.0089	8 02 23.4	9.487
11	21 54 17.39	2.0088	7 52 52.9	9.530
12	21 56 17.92	2.0088	7 43 19.8	9.573
13	21 58 18.45	2.0089	7 33 44.1	9.615
14	22 00 18.99	2.0091	7 24 06.0	9.656
15	22 02 19.54	2.0092	7 14 25.4	9.697
16	22 04 20.10	2.0094	7 04 42.3	9.738
17	22 06 20.67	2.0096	6 54 56.8	9.777
18	22 08 21.25	2.0098	6 45 09.0	9,817
19	22 10 21.85	2.0102	6 35 18.8	9.855
20	22 12 22.47	2.0105	6 25 26.4	9.892
21	22 14 23.11	2.0109	6 15 31.7	9.930
22	22 16 23.78	2.0113	6 05 34.8	9.967
23	22 18 24.47	+ 2.0117	S. 5 55 35.7	+ 10.002

THURSDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 20 25.19	+ 2.0123	S. 5 45 34.5	+ 10.037
1	22 22 25.95	2.0129	5 35 31.2	10.072
2	22 24 26.74	2.0134	5 25 25.9	10.105
3	22 26 27.56	2.0141	5 15 18.6	10.138
4	22 28 28.43	2.0148	5 05 09.3	10.172
5	22 30 29.34	2.0155	4 54 58.0	10.203
6	22 32 30.29	2.0162	4 44 44.9	10.234
7	22 34 31.29	2.0171	4 34 29.9	10.265
8	22 36 32.34	2.0180	4 24 13.1	10.295
9	22 38 33.45	2.0189	4 13 54.5	10.324
10	22 40 34.61	2.0198	4 03 34.2	10.352
11	22 42 35.83	2.0208	3 53 12.2	10.380
12	22 44 37.11	2.0219	3 42 48.6	10.407
13	22 46 38.46	2.0230	3 32 23.4	10.433
14	22 48 39.87	2.0242	3 21 56.6	10.460
15	22 50 41.36	2.0254	3 11 28.2	10.485
16	22 52 42.92	2.0267	3 00 58.4	10.509
17	22 54 44.56	2.0280	2 50 27.1	10.532
18	22 56 46.28	2.0293	2 39 54.5	10.555
19	22 58 48.08	2.0307	2 29 20.5	10.577
20	23 00 49.96	2.0322	2 18 45.2	10.599
21	23 02 51.94	2.0337	2 08 08.6	10.619
22	23 04 54.00	2.0352	1 57 30.9	10.639
23	23 06 56.16	2.0368	1 46 51.9	10.659
24	23 08 58.42	+ 2.0385	S. 1 36 11.8	+ 10.677

FRIDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ' "	"
0	23 08 58.42	+ 2.0385	S. 1 36 11.8	+ 10.677
1	23 11 00.78	2.0402	1 25 30.6	10.695
2	23 13 03.24	2.0419	1 14 48.4	10.712
3	23 15 05.81	2.0437	1 04 05.2	10.728
4	23 17 08.49	2.0457	0 53 21.0	10.744
5	23 19 11.29	2.0476	0 42 35.9	10.759
6	23 21 14.20	2.0495	0 31 49.9	10.773
7	23 23 17.23	2.0515	0 21 03.1	10.786
8	23 25 20.38	2.0536	S. 0 10 15.6	10.798
9	23 27 23.66	2.0557	N. 0 00 32.7	10.810
10	23 29 27.07	2.0579	0 11 21.6	10.821
11	23 31 30.61	2.0602	0 22 11.2	10.831
12	23 33 34.29	2.0625	0 33 01.3	10.840
13	23 35 38.11	2.0648	0 43 52.0	10.848
14	23 37 42.07	2.0672	0 54 43.1	10.856
15	23 39 46.17	2.0696	1 05 34.7	10.862
16	23 41 50.42	2.0722	1 16 26.6	10.868
17	23 43 54.83	2.0747	1 27 18.9	10.873
18	23 45 59.39	2.0773	1 38 11.4	10.877
19	23 48 04.11	2.0801	1 49 04.2	10.882
20	23 50 09.00	2.0828	1 59 57.2	10.884
21	23 52 14.05	2.0856	2 10 50.3	10.885
22	23 54 19.27	2.0884	2 21 43.4	10.886
23	23 56 24.66	+ 2.0913	N. 2 32 36.6	+ 10.886

SATURDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 58 30.23	+ 2.0942	N. 2 43 29.7	+ 10.885
1	0 00 35.97	2.0972	2 54 22.8	10.883
2	0 02 41.90	2.1003	3 05 15.7	10.880
3	0 04 48.01	2.1034	3 16 08.4	10.877
4	0 06 54.31	2.1066	3 27 00.9	10.872
5	0 09 00.80	2.1098	3 37 53.0	10.866
6	0 11 07.49	2.1132	3 48 44.8	10.860
7	0 13 14.38	2.1165	3 59 36.2	10.852
8	0 15 21.47	2.1199	4 10 27.1	10.844
9	0 17 28.77	2.1233	4 21 17.5	10.835
10	0 19 36.27	2.1268	4 32 07.3	10.824
11	0 21 43.99	2.1304	4 42 56.4	10.813
12	0 23 51.92	2.1340	4 53 44.8	10.801
13	0 26 00.07	2.1377	5 04 32.5	10.787
14	0 28 08.44	2.1414	5 15 19.3	10.773
15	0 30 17.04	2.1452	5 26 05.3	10.758
16	0 32 25.86	2.1489	5 36 50.3	10.742
17	0 34 34.91	2.1528	5 47 34.3	10.725
18	0 36 44.20	2.1567	5 58 17.3	10.707
19	0 38 53.72	2.1607	6 08 59.1	10.687
20	0 41 03.49	2.1648	6 19 39.7	10.667
21	0 43 13.50	2.1689	6 30 19.1	10.645
22	0 45 23.76	2.1731	6 40 57.1	10.622
23	0 47 34.27	2.1772	6 51 33.8	10.599
24	0 49 45.03	+ 2.1815	N. 7 02 09.0	+ 10.574

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
			SUNDAY 29.					TUESDAY, JULY 1.	
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 49 45.03	+ 2.1815	N. 7 02 09.0	+ 10.574	0	2 40 07.06	+ 2.4279	N.14 38 55.0	+ 7.971
1	0 51 56.05	2.1857	7 12 42.7	10.548					
2	0 54 07.32	2.1900	7 23 14.8	10.522					
3	0 56 18.85	2.1944	7 33 45.3	10.494					
4	0 58 30.65	2.1989	7 44 14.1	10.465					
5	1 00 42.72	2.2034	7 54 41.1	10.435					
6	1 02 55.06	2.2079	8 05 06.3	10.403					
7	1 05 07.67	2.2125	8 15 29.5	10.371					
8	1 07 20.56	2.2171	8 25 50.8	10.337					
9	1 09 33.72	2.2217	8 36 10.0	10.302					
10	1 11 47.17	2.2265	8 46 27.1	10.267					
11	1 14 00.90	2.2312	8 56 42.0	10.230					
12	1 16 14.91	2.2359	9 06 54.7	10.192					
13	1 18 29.21	2.2408	9 17 05.0	10.152					
14	1 20 43.81	2.2457	9 27 13.0	10.112					
15	1 22 58.70	2.2507	9 37 18.4	10.069					
16	1 25 13.89	2.2556	9 47 21.3	10.027					
17	1 27 29.37	2.2606	9 57 21.6	9.982					
18	1 29 45.16	2.2657	10 07 19.2	9.937					
19	1 32 01.25	2.2707	10 17 14.0	9.890					
20	1 34 17.64	2.2757	10 27 06.0	9.842					
21	1 36 34.34	2.2809	10 36 55.1	9.792					
22	1 38 51.35	2.2861	10 46 41.1	9.742					
23	1 41 08.67	+ 2.2912	N.10 56 24.1	+ 9.691					
			MONDAY 30.						
0	1 43 26.30	+ 2.2965	N.11 06 04.0	+ 9.638					
1	1 45 44.25	2.3018	11 15 40.7	9.583					
2	1 48 02.52	2.3071	11 25 14.0	9.528					
3	1 50 21.10	2.3123	11 34 44.0	9.472					
4	1 52 40.00	2.3177	11 44 10.6	9.413					
5	1 54 59.23	2.3232	11 53 33.6	9.353					
6	1 57 18.78	2.3285	12 02 53.0	9.292					
7	1 59 38.65	2.3339	12 12 08.7	9.231					
8	2 01 58.85	2.3394	12 21 20.7	9.167					
9	2 04 19.38	2.3448	12 30 28.8	9.102					
10	2 06 40.23	2.3503	12 39 33.0	9.037					
11	2 09 01.42	2.3558	12 48 33.2	8.969					
12	2 11 22.93	2.3612	12 57 29.3	8.901					
13	2 13 44.77	2.3668	13 06 21.3	8.831					
14	2 16 06.95	2.3724	13 15 09.0	8.759					
15	2 18 29.46	2.3779	13 23 52.4	8.687					
16	2 20 52.30	2.3835	13 32 31.4	8.612					
17	2 23 15.48	2.3891	13 41 05.9	8.537					
18	2 25 38.99	2.3946	13 49 35.8	8.460					
19	2 28 02.83	2.4002	13 58 01.1	8.382					
20	2 30 27.01	2.4057	14 06 21.7	8.302					
21	2 32 51.52	2.4113	14 14 37.4	8.222					
22	2 35 16.37	2.4169	14 22 48.3	8.1.0					
23	2 37 41.55	2.4224	14 30 54.2	8.056					
24	2 40 07.06	+ 2.4279	N.14 38 55.0	+ 7.971					

PHASES OF THE MOON.

			d	h	m
●	New Moon	June	5	18	10.9
☽	First Quarter		12	11	53.8
○	Full Moon		20	14	16.7
☾	Last Quarter		28	09	51.8

			d	h
☾	Perigee	June	5	17.2
☾	Apogee		19	04.9

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Noon.	P. L. of Diff.	IIIʰ.	P. L. of Diff.	VIʰ.	P. L. of Diff.	IXʰ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	SATURN	W.	67 28 49	2408	69 12 12	2390	70 56 01	2371	72 40 17	2353
	JUPITER	W.	47 39 55	2444	49 22 27	2422	51 05 30	2402	52 49 02	2383
	SUN	E.	65 16 15	2719	63 40 01	2701	62 03 22	2681	60 26 17	2663
2	SATURN	W.	81 28 14	2264	83 15 07	2246	85 02 26	2229	86 50 10	2213
	JUPITER	W.	61 33 35	2289	63 19 51	2270	65 06 34	2253	66 53 43	2235
	SUN	E.	52 14 33	2570	50 34 57	2553	48 54 57	2535	47 14 33	2519
3	SATURN	W.	95 54 49	2136	97 44 53	2122	99 35 19	2109	101 26 05	2096
	JUPITER	W.	75 55 43	2155	77 45 18	2141	79 35 15	2126	81 25 34	2113
	SUN	E.	38 46 55	2442	37 04 20	2429	35 21 26	2416	33 38 14	2404
7	SUN	W.	18 15 59	2364	20 00 26	2365	21 44 51	2366	23 29 14	2369
	Regulus	E.	55 07 34	2037	53 14 58	2046	51 22 36	2057	49 30 31	2070
	Spica	E.	108 43 50	2010	106 50 32	2019	104 57 28	2029	103 04 39	2039
8	SUN	W.	32 09 02	2413	33 52 18	2426	35 35 16	2438	37 17 56	2453
	Regulus	E.	40 15 05	2142	38 25 10	2159	36 35 40	2176	34 46 37	2196
	Spica	E.	93 44 45	2098	91 53 42	2112	90 03 01	2125	88 12 40	2139
9	SUN	W.	45 46 04	2531	47 26 34	2548	49 06 40	2566	50 46 22	2583
	Spica	E.	79 06 39	2218	77 18 39	2235	75 31 04	2252	73 43 54	2269
	Antares	E.	124 22 58	2270	122 36 15	2286	120 49 55	2301	119 03 57	2317
10	SUN	W.	58 58 38	2678	60 35 48	2696	62 12 33	2716	63 48 52	2735
	Pollux	W.	28 07 28	2778	29 42 25	2756	31 17 50	2739	32 53 38	2726
	Spica	E.	64 54 30	2359	63 09 56	2376	61 25 47	2394	59 42 04	2413
	Antares	E.	110 19 59	2400	108 36 24	2417	106 53 13	2434	105 10 27	2452
11	SUN	W.	71 44 04	2832	73 17 50	2851	74 51 12	2870	76 24 09	2889
	Pollux	W.	40 55 10	2716	42 31 29	2720	44 07 42	2727	45 43 46	2734
	Spica	E.	51 10 03	2504	49 28 56	2522	47 48 14	2540	46 07 56	2558
	Antares	E.	96 42 51	2541	95 02 35	2559	93 22 43	2576	91 43 15	2594
12	SUN	W.	84 02 55	2981	85 33 31	3000	87 03 44	3017	88 33 36	3034
	Pollux	W.	53 41 20	2782	55 16 11	2794	56 50 47	2805	58 25 09	2815
	Regulus	W.	16 41 25	2839	18 15 02	2829	19 48 52	2822	21 22 51	2818
	Spica	E.	37 52 31	2644	36 14 36	2661	34 37 04	2678	32 59 54	2693
	Antares	E.	83 31 55	2681	81 54 49	2697	80 18 05	2713	78 41 43	2729
13	SUN	W.	95 57 42	3116	97 25 32	3133	98 53 02	3147	100 20 15	3162
	Pollux	W.	66 13 13	2875	67 46 04	2887	69 18 39	2898	70 51 00	2909
	Regulus	W.	29 12 50	2837	30 46 30	2845	32 20 00	2853	33 53 19	2862
	Spica	E.	24 59 19	2771	23 24 13	2785	21 49 26	2801	20 14 59	2815
	Antares	E.	70 45 13	2809	69 10 57	2824	67 37 00	2838	66 03 22	2853
	SATURN	E.	119 15 20	2770	117 40 13	2785	116 05 25	2798	114 30 54	2811
	α Aquilæ	E.	119 56 07	3305	118 32 01	3304	117 07 54	3303	115 43 46	3304
14	SUN	W.	107 32 02	3230	108 57 36	3243	110 22 54	3255	111 47 58	3267
	Pollux	W.	78 29 10	2965	80 00 06	2976	81 30 49	2985	83 01 20	2996
	Regulus	W.	41 36 57	2909	43 09 05	2918	44 41 01	2927	46 12 46	2936
	Antares	E.	58 19 49	2923	56 47 59	2936	55 16 26	2949	53 45 09	2962

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P.L. of Diff.	XVh.	P.L. of Diff.	XVIIIh.	P.L. of Diff.	XXIh.	P.L. of Diff.
1	Saturn	W.	74 25 00	2335	76 10 09	2316	77 55 45	2298	79 41 47	2281
	Jupiter	W.	54 33 01	2364	56 17 28	2344	58 02 23	2326	59 47 45	2307
	Sun	E.	58 48 47	2643	57 10 51	2625	55 32 30	2607	53 53 44	2588
2	Saturn	W.	88 38 18	2196	90 26 51	2181	92 15 47	2165	94 05 07	2151
	Jupiter	W.	68 41 18	2218	70 29 18	2202	72 17 42	2186	74 06 31	2170
	Sun	E.	45 33 46	2502	43 52 36	2486	42 11 03	2471	40 29 09	2457
3	Saturn	W.	103 17 11	2084	105 08 35	2072	107 00 18	2061	108 52 18	2050
	Jupiter	W.	83 16 13	2100	85 07 12	2088	86 58 29	2077	88 50 04	2065
	Sun	E.	31 54 45	2394	30 11 01	2384	28 27 03	2375	26 42 53	2367
7	Sun	W.	25 13 33	2375	26 57 44	2382	28 41 44	2392	30 25 30	2402
	Regulus	E.	47 38 45	2082	45 47 18	2095	43 56 11	2109	42 05 26	2125
	Spica	E.	101 12 06	2050	99 19 49	2061	97 27 50	2072	95 36 08	2085
8	Sun	W.	39 00 16	2467	40 42 15	2482	42 23 53	2497	44 05 10	2514
	Regulus	E.	32 58 04	2217	31 10 02	2239	29 22 32	2262	27 35 37	2287
	Spica	E.	86 22 41	2155	84 33 05	2170	82 43 53	2186	80 55 04	2202
9	Sun	W.	52 25 40	2602	54 04 32	2621	55 42 59	2639	57 21 01	2657
	Spica	E.	71 57 09	2287	70 10 50	2304	68 24 58	2322	66 39 31	2340
	Antares	E.	117 18 23	2333	115 33 12	2349	113 48 24	2365	112 03 59	2382
10	Sun	W.	65 24 46	2755	67 00 13	2774	68 35 15	2793	70 09 52	2812
	Pollux	W.	34 29 43	2717	36 06 00	2713	37 42 23	2712	39 18 47	2713
	Spica	E.	57 58 48	2431	56 15 58	2450	54 33 34	2468	52 51 36	2486
	Antares	E.	103 28 06	2470	101 46 10	2487	100 04 39	2505	98 23 33	2522
11	Sun	W.	77 56 42	2909	79 28 50	2927	81 00 35	2946	82 31 56	2963
	Pollux	W.	47 19 41	2742	48 55 25	2752	50 30 56	2761	52 06 15	2772
	Spica	E.	44 28 03	2575	42 48 34	2593	41 09 30	2610	39 30 49	2627
	Antares	E.	90 04 12	2612	88 25 33	2629	86 47 17	2646	85 09 24	2663
12	Sun	W.	90 03 07	3052	91 32 16	3069	93 01 04	3084	94 29 33	3101
	Pollux	W.	59 59 17	2828	61 33 09	2840	63 06 45	2851	64 40 07	2863
	Regulus	W.	22 56 55	2817	24 31 02	2819	26 05 06	2824	27 39 02	2830
	Spica	E.	31 23 05	2710	29 46 38	2725	28 10 31	2741	26 34 45	2756
	Antares	E.	77 05 42	2746	75 30 03	2763	73 54 46	2778	72 19 49	2794
13	Sun	W.	101 47 10	3176	103 13 48	3191	104 40 08	3204	106 06 13	3217
	Pollux	W.	72 23 07	2921	73 54 59	2933	75 26 36	2943	76 58 00	2954
	Regulus	W.	35 26 26	2872	36 59 21	2880	38 32 05	2890	40 04 37	2899
	Spica	E.	18 40 50	2829	17 07 00	2843	15 33 28	2859	14 00 16	2873
	Antares	E.	64 30 03	2868	62 57 03	2882	61 24 21	2895	59 51 56	2909
	Saturn	E.	112 56 40	2823	111 22 42	2835	109 49 00	2847	108 15 33	2859
	a Aquilæ	E.	114 19 39	3305	112 55 33	3306	111 31 28	3308	110 07 26	3311
14	Sun	W.	113 12 48	3279	114 37 24	3289	116 01 48	3300	117 25 59	3311
	Pollux	W.	84 31 38	3006	86 01 43	3015	87 31 37	3025	89 01 19	3034
	Regulus	W.	47 44 19	2945	49 15 41	2953	50 46 53	2962	52 17 54	2969
	Antares	E.	52 14 09	2975	50 43 25	2988	49 12 57	3001	47 42 45	3013

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object	Noon.	P.L. of Diff.	IIIʰ.	P.L. of Diff.	VIʰ.	P.L. of Diff.	IXʰ.	P.L. of Diff.
14	SATURN E.	106 42 22	2871	105 09 26	2881	103 36 43	2891	102 04 13	2902
	a Aquilæ E.	108 43 27	3315	107 19 33	3319	105 55 44	3323	104 31 59	3328
	JUPITER E.	127 03 46	2894	125 31 19	2904	123 59 05	2914	122 27 04	2924
15	SUN W.	118 49 58	3321	120 13 45	3331	121 37 21	3340	123 00 46	3349
	Pollux W.	90 30 50	3043	92 00 10	3052	93 29 19	3060	94 58 17	3068
	Regulus W.	53 48 45	2977	55 19 26	2985	56 49 58	2993	58 20 20	2999
	Antares E.	46 12 48	3025	44 43 06	3038	43 13 40	3051	41 44 30	3064
	SATURN E.	94 24 56	2949	92 53 39	2958	91 22 33	2965	89 51 37	2973
	a Aquilæ E.	97 34 45	3356	96 11 38	3362	94 48 38	3368	93 25 45	3375
	JUPITER E.	114 49 51	2967	113 18 57	2974	111 48 12	2981	110 17 36	2989
16	Pollux W.	102 20 45	3106	103 48 47	3114	105 16 40	3120	106 44 25	3126
	Regulus W.	65 50 08	3030	67 19 43	3035	68 49 12	3041	70 18 34	3045
	Spica W.	12 00 44	3025	13 30 26	3028	15 00 04	3031	16 29 38	3035
	Antares E.	34 22 44	3133	32 55 15	3150	31 28 06	3167	30 01 17	3186
	SATURN E.	82 19 15	3007	80 49 11	3013	79 19 14	3018	77 49 24	3024
	a Aquilæ E.	86 33 19	3410	85 11 14	3418	83 49 18	3425	82 27 30	3434
	JUPITER E.	102 46 44	3021	101 16 57	3026	99 47 16	3030	98 17 41	3035
17	Pollux W.	114 01 14	3158	115 28 13	3164	116 55 05	3171	118 21 49	3177
	Regulus W.	77 44 05	3065	79 12 57	3069	80 41 45	3071	82 10 30	3073
	Spica W.	23 56 23	3052	25 25 32	3055	26 54 37	3057	28 23 39	3060
	SATURN E.	70 21 47	3047	68 52 32	3050	67 23 21	3053	65 54 14	3056
	a Aquilæ E.	75 40 55	3478	74 20 06	3488	72 59 28	3498	71 39 02	3508
	JUPITER E.	90 51 11	3056	89 22 07	3059	87 53 07	3061	86 24 10	3064
	Fomalhaut E.	105 34 55	3530	104 15 04	3528	102 55 11	3525	101 35 15	3523
	a Pegasi E.	123 07 35	3292	121 43 14	3288	120 18 48	3283	118 54 17	3280
18	Regulus W.	89 33 30	3084	91 01 59	3085	92 30 27	3087	93 58 53	3087
	Spica W.	35 48 08	3069	37 16 56	3070	38 45 42	3071	40 14 27	3072
	SATURN E.	58 29 34	3069	57 00 47	3072	55 32 03	3073	54 03 21	3075
	a Aquilæ E.	64 59 55	3570	63 40 48	3584	62 21 56	3599	61 03 21	3616
	JUPITER E.	79 00 14	3075	77 31 34	3076	76 02 55	3077	74 34 17	3078
	Fomalhaut E.	94 55 04	3517	93 34 59	3516	92 14 53	3516	90 54 47	3517
	a Pegasi E.	111 50 45	3265	110 25 53	3263	109 00 58	3260	107 36 00	3258
19	Regulus W.	101 20 56	3089	102 49 19	3089	104 17 42	3088	105 46 06	3087
	Spica W.	47 38 04	3072	49 06 48	3072	50 35 32	3071	52 04 17	3070
	SATURN E.	46 40 21	3082	45 11 50	3084	43 43 21	3086	42 14 54	3087
	a Aquilæ E.	54 35 16	3717	53 18 47	3742	52 02 44	3769	50 47 09	3798
	JUPITER E.	67 11 26	3081	65 42 53	3081	64 14 20	3081	62 45 47	3081
	Fomalhaut E.	84 14 33	3524	82 54 35	3527	81 34 41	3529	80 14 49	3533
	a Pegasi E.	100 30 33	3248	99 05 21	3247	97 40 07	3245	96 14 51	3242
20	Regulus W.	113 08 21	3082	114 36 52	3081	116 05 25	3080	117 33 59	3079
	Spica W.	59 28 22	3064	60 57 16	3061	62 26 13	3060	63 55 12	3057
	SATURN E.	34 53 03	3096	33 24 48	3098	31 56 36	3101	30 28 27	3105
	a Aquilæ E.	44 37 51	3992	43 26 04	4043	42 15 07	4100	41 05 05	4162
	JUPITER E.	55 22 55	3078	53 54 18	3078	52 25 41	3076	50 57 02	3076
	Fomalhaut E.	73 36 34	3555	72 17 11	3562	70 57 55	3569	69 38 47	3576
	a Pegasi E.	89 07 58	3235	87 42 30	3233	86 17 00	3231	84 51 28	3231

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVʰ.	P. L. of Diff.	XVIIIʰ.	P. L. of Diff.	XXIʰ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
14	SATURN	E.	100 31 57	2912	98 59 54	2922	97 28 03	2931	95 56 24	2940
	a Aquilæ	E.	103 08 20	3333	101 44 47	3338	100 21 20	3344	98 57 59	3350
	JUPITER	E.	120 55 15	2933	119 23 37	2942	117 52 11	2950	116 20 56	2958
15	SUN	W.	124 24 01	3358	125 47 05	3366	127 10 00	3374	128 32 46	3381
	Pollux	W.	96 27 06	3076	97 55 45	3084	99 24 14	3091	100 52 34	3099
	Regulus	W.	59 50 34	3006	61 20 39	3013	62 50 36	3018	64 20 26	3025
	Antares	E.	40 15 36	3077	38 46 58	3090	37 18 36	3104	35 50 31	3119
	SATURN	E.	88 20 51	2981	86 50 14	2988	85 19 46	2995	83 49 27	3001
	a Aquilæ	E.	92 03 00	3382	90 40 23	3389	89 17 54	3396	87 55 33	3402
	JUPITER	E.	108 47 09	2996	107 16 51	3002	105 46 41	3009	104 16 39	3015
16	Pollux	W.	108 12 03	3133	109 39 32	3139	111 06 54	3146	112 34 08	3153
	Regulus	W.	71 47 51	3050	73 17 02	3055	74 46 07	3058	76 15 08	3061
	Spica	W.	17 59 07	3038	19 28 33	3042	20 57 54	3045	22 27 11	3049
	Antares	E.	28 34 51	3208	27 08 51	3231	25 43 19	3257	24 18 17	3286
	SATURN	E.	76 19 41	3029	74 50 04	3034	73 20 33	3038	71 51 07	3043
	a Aquilæ	E.	81 05 52	3442	79 44 23	3451	78 23 04	3459	77 01 54	3469
	JUPITER	E.	96 48 12	3040	95 18 49	3045	93 49 32	3048	92 20 19	3052
17	Pollux	W.	119 48 26	3183	121 14 55	3189	122 41 17	3195	124 07 32	3202
	Regulus	W.	83 39 12	3077	85 07 50	3079	86 36 25	3081	88 04 58	3082
	Spica	W.	29 52 38	3062	31 21 34	3065	32 50 27	3066	34 19 18	3067
	SATURN	E.	64 25 11	3060	62 56 12	3062	61 27 16	3065	59 58 24	3067
	a Aquilæ	E.	70 18 47	3519	68 58 44	3531	67 38 54	3543	66 19 17	3556
	JUPITER	E.	84 55 17	3067	83 26 27	3070	81 57 41	3071	80 28 56	3073
	Fomalhaut	E.	100 15 16	3521	98 55 15	3520	97 35 13	3518	96 15 09	3517
	a Pegasi	E.	117 29 42	3276	116 05 03	3274	114 40 21	3270	113 15 35	3267
18	Regulus	W.	95 27 19	3087	96 55 44	3088	98 24 08	3088	99 52 32	3088
	Spica	W.	41 43 11	3072	43 11 55	3073	44 40 37	3073	46 09 20	3072
	SATURN	E.	52 34 41	3077	51 06 03	3078	49 37 27	3080	48 08 53	3082
	a Aquilæ	E.	59 45 04	3634	58 27 06	3652	57 09 27	3672	55 52 10	3693
	JUPITER	E.	73 05 41	3079	71 37 06	3080	70 08 32	3081	68 39 59	3081
	Fomalhaut	E.	89 34 42	3518	88 14 38	3519	86 54 35	3520	85 34 33	3522
	a Pegasi	E.	106 10 59	3256	104 45 56	3254	103 20 51	3252	101 55 43	3250
19	Regulus	W.	107 14 31	3087	108 42 57	3087	110 11 23	3085	111 39 51	3083
	Spica	W.	53 33 03	3069	55 01 50	3068	56 30 39	3066	57 59 30	3065
	SATURN	E.	40 46 28	3088	39 18 04	3089	37 49 41	3091	36 21 21	3093
	a Aquilæ	E.	49 32 05	3830	48 17 34	3866	47 03 40	3905	45 50 25	3946
	JUPITER	E.	61 17 14	3080	59 48 40	3080	58 20 06	3079	56 51 31	3078
	Fomalhaut	E.	78 55 01	3536	77 35 17	3540	76 15 37	3545	74 56 03	3550
	a Pegasi	E.	94 49 32	3242	93 24 12	3239	91 58 49	3237	90 33 24	3236
20	Regulus	W.	119 02 36	3076	120 31 15	3074	121 59 56	3073	123 28 39	3070
	Spica	W	65 24 14	3055	66 53 19	3052	68 22 27	3049	69 51 39	3047
	SATURN	E.	29 00 23	3110	27 32 25	3116	26 04 35	3122	24 36 52	3129
	a Aquilæ	E.	39 56 03	4231	38 48 06	4309	37 41 22	4395	36 35 56	4490
	JUPITER	E.	49 28 23	3074	47 59 42	3074	46 31 01	3073	45 02 18	3073
	Fomalhaut	E.	68 19 47	3585	67 00 56	3594	65 42 15	3604	64 23 45	3616
	a Pegasi	E.	83 25 55	3229	82 00 20	3228	80 34 44	3227	79 09 07	3225

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
21	Spica	W.	71 20 54	3043	72 50 13	3040	74 19 36	3037	75 49 03	3033
	Antares	W.	26 43 10	3223	28 08 52	3204	29 34 56	3187	31 01 21	3171
	JUPITER	E.	43 33 35	3071	42 04 50	3071	40 36 05	3071	39 07 20	3070
	Fomalhaut	E.	63 05 28	3627	61 47 23	3641	60 29 33	3655	59 11 58	3672
	a Pegasi	E.	77 43 28	3225	76 17 48	3225	74 52 08	3224	73 26 26	3223
22	Spica	W.	83 17 28	3014	84 47 24	3009	86 17 26	3005	87 47 33	2999
	Antares	W.	38 17 43	3108	39 45 43	3098	41 13 55	3087	42 42 20	3078
	JUPITER	E.	31 43 38	3076	30 14 59	3079	28 46 24	3083	27 17 53	3088
	Fomalhaut	E.	52 48 56	3778	51 33 31	3806	50 18 35	3837	49 04 11	3871
	a Pegasi	E.	66 17 53	3223	64 52 11	3224	63 26 30	3225	62 00 51	3226
	VENUS	E.	125 29 47	3449	124 08 26	3444	122 46 59	3438	121 25 26	3433
23	Spica	W.	95 19 46	2973	96 50 33	2966	98 21 28	2960	99 52 31	2954
	Antares	W.	50 07 11	3034	51 36 41	3026	53 06 22	3018	54 36 13	3009
	a Pegasi	E.	54 53 09	3241	53 27 48	3246	52 02 33	3252	50 37 25	3259
	VENUS	E.	114 36 06	3404	113 13 54	3397	111 51 34	3390	110 29 06	3384
24	Spica	W.	107 29 46	2920	109 01 40	2912	110 33 43	2904	112 05 57	2896
	Antares	W.	62 08 08	2966	63 39 03	2958	65 10 09	2949	66 41 26	2939
	a Pegasi	E.	43 34 13	3313	42 10 17	3330	40 46 40	3349	39 23 24	3371
	VENUS	E.	103 34 46	3346	102 11 28	3338	100 48 00	3328	99 24 21	3319
25	Antares	W.	74 20 48	2892	75 53 16	2883	77 25 57	2873	78 58 51	2863
	SATURN	W.	26 34 35	2911	28 06 40	2894	29 39 06	2879	31 11 52	2863
	VENUS	E.	92 23 31	3272	90 58 48	3262	89 33 52	3252	88 08 44	3241
26	Antares	W.	86 46 46	2808	88 21 03	2797	89 55 35	2785	91 30 23	2773
	SATURN	W.	39 00 36	2790	40 35 17	2776	42 10 16	2762	43 45 34	2748
	VENUS	E.	80 59 46	3183	79 33 16	3171	78 06 32	3158	76 39 32	3145
	SUN	E.	119 00 29	3127	117 32 52	3114	116 05 00	3101	114 36 52	3088
27	Antares	W.	99 28 18	2712	101 04 42	2699	102 41 23	2686	104 18 22	2673
	SATURN	W.	51 46 41	2678	53 23 50	2664	55 01 18	2649	56 39 06	2635
	VENUS	E.	69 20 33	3076	67 51 54	3062	66 22 59	3047	64 53 45	3032
	SUN	E.	107 12 06	3019	105 42 17	3005	104 12 11	2990	102 41 46	2976
28	Antares	W.	112 27 41	2606	114 06 28	2593	115 45 33	2579	117 24 57	2565
	SATURN	W.	64 53 07	2560	66 32 57	2545	68 13 08	2530	69 53 40	2514
	JUPITER	W.	44 23 08	2582	46 02 28	2564	47 42 12	2547	49 22 20	2530
	VENUS	E.	57 22 51	2955	55 51 42	2939	54 20 12	2922	52 48 21	2906
	SUN	E.	95 04 58	2898	93 32 37	2882	91 59 56	2866	90 26 54	2851
29	SATURN	W.	78 21 47	2436	80 04 31	2420	81 47 37	2404	83 31 06	2389
	JUPITER	W.	57 48 52	2445	59 31 22	2430	61 14 14	2413	62 57 30	2396
	VENUS	E.	45 03 51	2822	43 29 52	2805	41 55 31	2788	40 20 48	2771
	SUN	E.	82 36 30	2768	81 01 20	2752	79 25 49	2735	77 49 55	2719
30	SATURN	W.	92 14 07	2311	93 59 51	2296	95 45 57	2281	97 32 25	2266
	JUPITER	W.	71 39 47	2315	73 25 25	2300	75 11 25	2284	76 57 48	2268
	VENUS	E.	32 21 37	2687	30 44 40	2670	29 07 20	2654	27 29 39	2638
	SUN	E.	69 44 59	2636	68 06 53	2621	66 28 26	2504	64 49 37	2589

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
21	Spica	W.	77 18 35	3030	78 48 11	3026	80 17 51	3022	81 47 37	3018
	Antares	W.	32 28 05	3157	33 55 06	3143	35 22 24	3131	36 49 57	3119
	JUPITER	E.	37 38 34	3070	36 09 48	3072	34 41 04	3072	33 12 20	3073
	Fomalhaut	E.	57 54 41	3689	56 37 42	3709	55 21 04	3729	54 04 48	3752
	a Pegasi	E.	72 00 44	3223	70 35 02	3222	69 09 19	3222	67 43 36	3222
22	Spica	W.	89 17 47	2994	90 48 07	2989	92 18 33	2984	93 49 06	2978
	Antares	W.	44 10 57	3069	45 39 44	3060	47 08 42	3052	48 37 51	3043
	JUPITER	E.	25 49 28	3096	24 21 13	3107	22 53 12	3120	21 25 27	3133
	Fomalhaut	E.	47 50 22	3910	46 37 12	3950	45 24 43	3997	44 13 00	4047
	a Pegasi	E.	60 35 13	3228	59 09 37	3231	57 44 04	3234	56 18 34	3237
	VENUS	E.	120 03 47	3428	118 42 02	3422	117 20 10	3416	115 58 11	3410
23	Spica	W.	101 23 41	2948	102 54 59	2941	104 26 26	2934	105 58 02	2927
	Antares	W.	56 06 15	3001	57 36 27	2992	59 06 50	2983	60 37 24	2975
	a Pegasi	E.	49 12 25	3266	47 47 34	3276	46 22 54	3287	44 58 26	3299
	VENUS	E.	109 06 31	3377	107 43 48	3369	106 20 56	3361	104 57 55	3354
24	Spica	W.	113 38 21	2888	115 10 55	2880	116 43 39	2871	118 16 35	2862
	Antares	W.	68 12 55	2930	69 44 35	2921	71 16 27	2912	72 48 31	2902
	a Pegasi	E.	38 00 34	3397	36 38 14	3426	35 16 27	3461	33 55 19	3502
	VENUS	E.	98 00 32	3311	96 36 33	3302	95 12 24	3292	93 48 03	3282
25	Antares	W.	80 31 59	2852	82 05 20	2841	83 38 54	2830	85 12 43	2819
	SATURN	W.	32 44 58	2848	34 18 24	2833	35 52 09	2818	37 26 13	2804
	VENUS	E.	86 43 23	3230	85 17 49	3219	83 52 02	3207	82 26 01	3195
26	Antares	W.	93 05 26	2761	94 40 44	2749	96 16 19	2737	97 52 10	2724
	SATURN	W.	45 21 10	2734	46 57 05	2720	48 33 18	2706	50 09 50	2692
	VENUS	E.	75 12 17	3132	73 44 46	3119	72 16 59	3104	70 48 54	3090
	SUN	E.	113 08 28	3075	111 39 48	3061	110 10 51	3047	108 41 37	3034
27	Antares	W.	105 55 38	2660	107 33 12	2647	109 11 03	2633	110 49 13	2620
	SATURN	W.	58 17 14	2621	59 55 41	2605	61 34 29	2590	63 13 38	2575
	VENUS	E.	63 24 12	3017	61 54 20	3002	60 24 10	2986	58 53 40	2971
	SUN	E.	101 11 03	2961	99 40 01	2946	98 08 40	2930	96 36 59	2914
28	Antares	W.	119 04 40	2552	120 44 41	2538	122 25 01	2525	124 05 39	2511
	SATURN	W.	71 34 34	2499	73 15 49	2483	74 57 26	2467	76 39 26	2452
	JUPITER	W.	51 02 51	2513	52 43 46	2497	54 25 04	2480	56 06 46	2462
	VENUS	E.	51 16 10	2889	49 43 37	2872	48 10 42	2856	46 37 27	2840
	SUN	E.	88 53 32	2834	87 19 48	2818	85 45 44	2801	84 11 18	2785
29	SATURN	W.	85 14 57	2373	86 59 11	2357	88 43 47	2342	90 28 46	2326
	JUPITER	W.	64 41 11	2380	66 25 15	2364	68 09 42	2347	69 54 33	2331
	VENUS	E.	38 45 42	2754	37 10 14	2738	35 34 24	2721	33 58 12	2704
	SUN	E.	76 13 40	2702	74 37 03	2686	73 00 04	2669	71 22 43	2652
30	SATURN	W.	99 19 15	2251	101 06 27	2237	102 54 00	2222	104 41 55	2208
	JUPITER	W.	78 44 34	2253	80 31 42	2238	82 19 13	2223	84 07 06	2208
	VENUS	E.	25 51 35	2621	24 13 09	2606	22 34 22	2591	20 55 14	2576
	SUN	E.	63 10 27	2574	61 30 56	2559	59 51 04	2543	58 10 51	2528

AT GREENWICH APPARENT NOON.

THE SUN'S

Day of the Week	Day of the Month	Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	o ′ ″	″	′ ″	s	m s	s
Tues.	1	6 37 50.88	+ 10.351	N.23 09 52.1	− 9.36	15 45.00	68.72	3 25.42	0.493
Wed.	2	6 41 59.21	10.341	23 05 55.1	10.37	15 44.99	68.69	3 37.15	0.483
Thur.	3	6 46 07.28	10.331	23 01 34.0	11.38	15 44.99	68.65	3 48.64	0.473
Frid.	4	6 50 15.08	+ 10.319	22 56 48.7	− 12.38	15 44.99	68.61	3 59.85	0.462
Sat.	5	6 54 22.59	10.306	22 51 39.5	13.38	15 44.99	68.57	4 10.77	0.449
SUN.	6	6 58 29.78	10.292	22 46 06.3	14.37	15 45.00	68.53	4 21.38	0.435
Mon.	7	7 02 36.61	+ 10.277	22 40 09.4	− 15.36	15 45.01	68.48	4 31.63	0.419
Tues.	8	7 06 43.08	10.261	22 33 49.0	16.33	15 45.02	68.43	4 41.51	0.403
Wed.	9	7 10 49.16	10.245	22 27 05.2	17.30	15 45.04	68.37	4 51.01	0.387
Thur.	10	7 14 54.83	+ 10.227	22 19 58.1	− 18.27	15 45.06	68.31	5 00.09	0.369
Frid.	11	7 19 00.05	10.208	22 12 27.9	19.23	15 45.09	68.25	5 08.73	0.351
Sat.	12	7 23 04.82	10.189	22 04 35.0	20.18	15 45.13	68.19	5 16.93	0.332
SUN.	13	7 27 09.12	+ 10.169	21 56 19.3	− 21.12	15 45.17	68.12	5 24.65	0.312
Mon.	14	7 31 12.94	10.149	21 47 41.1	22.05	15 45.21	68.06	5 31.89	0.292
Tues.	15	7 35 16.27	10.128	21 38 40.4	22.98	15 45.26	67.99	5 38.64	0.271
Wed.	16	7 39 19.09	+ 10.107	21 29 17.7	− 23.90	15 45.31	67.92	5 44.89	0.250
Thur.	17	7 43 21.39	10.085	21 19 33.1	24.81	15 45.37	67.85	5 50.63	0.228
Frid.	18	7 47 23.16	10.063	21 09 26.8	25.71	15 45.43	67.78	5 55.83	0.206
Sat.	19	7 51 24.40	+ 10.040	20 58 58.9	− 26.60	15 45.50	67.70	6 00.50	0.183
SUN.	20	7 55 25.09	10.017	20 48 09.8	27.48	15 45.57	67.63	6 04.63	0.161
Mon.	21	7 59 25.24	9.994	20 36 59.7	28.35	15 45.65	67.55	6 08.20	0.138
Tues.	22	8 03 24.82	+ 9.971	20 25 28.7	− 29.21	15 45.73	67.47	6 11.23	0.115
Wed.	23	8 07 23.86	9.948	20 13 37.1	30.07	15 45.81	67.39	6 13.70	0.091
Thur.	24	8 11 22.31	9.924	20 01 25.2	30.91	15 45.90	67.30	6 15.59	0.068
Frid.	25	8 15 20.22	+ 9.901	19 48 53.2	− 31.74	15 45.99	67.22	6 16.93	0.044
Sat.	26	8 19 17.54	9.877	19 36 01.3	32.56	15 46.08	67.14	6 17.69	0.020
SUN.	27	8 23 14.30	9.853	19 22 49.8	33.38	15 46.18	67.05	6 17.90	0.004
Mon.	28	8 27 10.46	+ 9.828	19 09 19.0	− 34.18	15 46.28	66.97	6 17.51	0.028
Tues.	29	8 31 06.06	9.804	18 55 29.1	34.97	15 46.39	66.88	6 16.55	0.052
Wed.	30	8 35 01.07	9.780	18 41 20.4	35.74	15 46.50	66.80	6 15.01	0.076
Thur.	31	8 38 55.49	9.755	18 26 53.3	36.51	15 46.61	66.71	6 12.89	0.101
Frid.	32	8 42 49.32	+ 9.731	N.18 12 08.0	− 37.26	15 46.73	66.63	6 10.17	0.125

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting 0.19ˢ from the sidereal time. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week	Day of the Month	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	THE SUN'S Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	6 37 50.29	+ 10.349	N.23 09 52.6	− 9.36	3 25.39	− 0.493	6 34 24.90
Wed.	2	6 41 58.58	10.340	23 05 55.7	10.37	3 37.12	0.483	6 38 21.46
Thur.	3	6 46 06.62	10.330	23 01 34.7	11.38	3 48.61	0.473	6 42 18.01
Frid.	4	6 50 14.39	+ 10.318	22 56 49.5	− 12.38	3 59.82	− 0.462	6 46 14.57
Sat.	5	6 54 21.87	10.305	22 51 40.4	13.38	4 10.74	0.449	6 50 11.13
SUN.	6	6 58 29.03	10.291	22 46 07.3	14.37	4 21.35	0.435	6 54 07.68
Mon.	7	7 02 35.84	+ 10.276	22 40 10.6	− 15.36	4 31.60	− 0.419	6 58 04.24
Tues.	8	7 06 42.28	10.260	22 33 50.3	16.33	4 41.48	0.403	7 02 00.80
Wed.	9	7 10 48.33	10.243	22 27 06.6	.17.30	4 50.98	0.387	7 05 57.35
Thur.	10	7 14 53.97	+ 10.226	.22 19 .59.6	− 18.27	5 00.06	− 0.369	7 09 53.91
Frid.	11	7 18 59.17	10.207	22 12 29.6	19.23	5 08.70	0.351	7 13 50.47
Sat.	12	7 23 03.92	10.188	22 04 36.8	20.18	5 16.90	0.332	7 17 47.02
SUN.	13	7 27 08.20	+ 10.168	21 56 21.2	− 21.12	5 24.62	− 0.312	7 21 43.58
Mon.	14	7 31 12.00	10.148	21 47 43.1	22.05	5 31.86	0.292	7 25 40.14
Tues.	15	7 35 15.32	10.127	21 38 42.6	22.98	5 38.61	0.271	7 29 36.69
Wed.	16	7 39 18.12	+ 10.106	21 29 20.0	− 23.90	5 44.87	− 0.250	7 33 33.25
Thur.	17	7 43 20.41	10.084	21 19 35.5	24.81	5 50.61	0.228	7 37 29.80
Frid.	18	7 47 22.17	10.062	21 09 29.3	25.71	5 55.81	0.206	7 41 26.36
Sat.	19	7 51 23.40	+ 10.040	20 59 01.6	− 26.60	6 00.48	− 0.183	7 45 22.92
SUN.	20	7 55 24.08	10.017	20 48 12.6	27.48	6 04.61	0.161	7 49 19.47
Mon.	21	7 59 24.22	9.994	20 37 02.6	28.35	6 08.19	0.138	7 53 16.03
Tues.	22	8 03 23.80	+ 9.971	20 25 31.7	− 29.21	6 11.22	− 0.115	7 57 12.58
Wed.	23	8 07 22.83	9.948	20 13 40.2	30.07	6 13.69	0.091	8 01 09.14
Thur.	24	8 11 21.28	9.924	20 01 28.4	30.91	6 15.58	0.068	8 05 05.70
Frid.	25	8 15 19.18	+ 9.901	19 48 56.5	− 31.74	6 16.93	− 0.044	8 09 02.25
Sat.	26	8 19 16.50	9.877	19 36 04.7	32.56	6 17.69	− 0.020	8 12 58.81
SUN.	27	8 23 13.26	9.853	19 22 53.3	33.38	6 17.90	+ 0.004	8 16 55.36
Mon.	28	8 27 09.43	+ 9.829	19 09 22.6	− 34.18	6 17.51	+ 0.028	8 20 51.92
Tues.	29	8 31 05.03	9.805	18 55 32.8	34.97	6 16.56	0.052	8 24 48.47
Wed.	30	8 35 00.05	9.780	18 41 24.2	35.74	6 15.02	0.076	8 28 45.03
Thur.	31	8 38 54.48	9.756	18 26 57.1	36.51	6 12.90	0.101	8 32 41.58
Frid.	32	8 42 48.32	+ 9.731	N.18 12 11.8	− 37.26	6 10.18	+ 0.125	8 36 38.14

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour, +9.8565ˢ. (Table III.)

AT GREENWICH MEAN NOON.

THE SUN'S

Day of the Month.	Day of the Year.	TRUE LONGITUDE. λ	TRUE LONGITUDE. λ'	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	182	98 41 46.7	41 12.4	143.04	+ 0.09	0.007 2104	+ 3.2	17 22 43.81
2	183	99 38 59.8	38 25.3	143.04	− 0.04	0.007 2171	2.2	17 18 47.90
3	184	100 36 13.0	35 38.4	143.05	0.15	0.007 2212	+ 1.1	17 14 51.98
4	185	101 33 26.4	32 51.6	143.05	− 0.24	0.007 2227	0.0	17 10 56.07
5	186	102 30 39.8	30 04.8	143.06	0.29	0.007 2214	− 1.1	17 07 00.16
6	187	103 27 53.3	27 18.2	143.06	0.32	0.007 2174	2.2	17 03 04.25
7	188	104 25 06.8	24 31.5	143.06	− 0.31	0.007 2108	− 3.3	16 59 08.34
8	189	105 22 20.3	21 44.8	143.06	0.29	0.007 2015	4.4	16 55 12.43
9	190	106 19 33.7	18 58.1	143.06	0.21	0.007 1896	5.4	16 51 16.52
10	191	107 16 47.0	16 11.2	143.06	− 0.14	0.007 1754	− 6.4	16 47 20.61
11	192	108 14 00.3	13 24.3	143.05	− 0.04	0.007 1589	7.3	16 43 24.70
12	193	109 11 13.5	10 37.4	143.05	+ 0.10	0.007 1402	8.2	16 39 28.79
13	194	110 08 26.7	07 50.4	143.05	+ 0.22	0.007 1195	− 9.0	16 35 32.88
14	195	111 05 39.9	05 03.5	143.05	0.35	0.007 0969	9.8	16 31 36.97
15	196	112 02 53.2	02 16.7	143.06	0.48	0.007 0726	10.5	16 27 41.06
16	197	112 60 06.7	59 30.0	143.07	+ 0.59	0.007 0465	− 11.2	16 23 45.15
17	198	113 57 20.4	56 43.6	143.08	0.67	0.007 0187	11.9	16 19 49.24
18	199	114 54 34.4	53 57.4	143.09	0.74	0.006 9894	12.5	16 15 53.33
19	200	115 51 48.7	51 11.6	143.11	+ 0.79	0.006 9586	− 13.1	16 11 57.42
20	201	116 49 03.5	48 26.2	143.13	0.82	0.006 9263	13.7	16 08 01.51
21	202	117 46 18.7	45 41.3	143.15	0.81	0.006 8926	14.3	16 04 05.60
22	203	118 43 34.6	42 57.0	143.17	+ 0.78	0.006 8575	− 14.9	16 00 09.69
23	204	119 40 51.1	40 13.4	143.20	0.71	0.006 8209	15.5	15 56 13.78
24	205	120 38 08.4	37 30.5	143.23	0.63	0.006 7829	16.1	15 52 17.87
25	206	121 35 26.5	34 48.5	143.27	+ 0.53	0.006 7434	− 16.8	15 48 21.96
26	207	122 32 45.5	32 07.4	143.31	0.41	0.006 7023	17.5	15 44 26.05
27	208	123 30 05.6	29 27.3	143.36	0.28	0.006 6595	18.2	15 40 30.14
28	209	124 27 26.6	26 48.2	143.40	+ 0.15	0.006 6148	− 19.0	15 36 34.23
29	210	125 24 48.7	24 10.2	143.44	+ 0.02	0.006 5683	19.8	15 32 38.32
30	211	126 22 12.0	21 33.3	143.49	− 0.09	0.006 5197	20.7	15 28 42.41
31	212	127 19 36.3	18 57.5	143.54	0.19	0.006 4689	21.6	15 24 46.50
32	213	128 17 01.7	16 22.8	143.58	− 0.24	0.006 4158	− 22.6	15 20 50.59

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January 0.0ᵈ of the Besselian fictitious year.

Diff. for 1 Hour,
— 9.8296ˢ.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month	SEMIDIAMETER		HORIZONTAL PARALLAX				UPPER TRANSIT		AGE
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	° ′	″	° ′	″	h m	m	d
1	16 19.9	16 25.5	59 50.3	+ 1.80	60 11.0	+ 1.63	20 54.2	+ 2.47	25.2
2	16 30.5	16 34.7	60 29.3	1.40	60 44.5	1.12	21 55.0	2.57	26.2
3	16 37.8	16 39.9	60 56.1	0.80	61 03.7	+ 0.44	22 57.5	2.61	27.2
4	16 40.7	16 40.3	61 06.7	+ 0.06	61 05.2	− 0.33	23 59.9	+ 2.56	28.2
5	16 38.6	16 35.7	60 59.0	− 0.70	60 48.3	1.06	☽		29.2
6	16 31.6	16 26.5	60 33.3	1.40	60 14.6	1.69	1 00.2	2.45	1.0
7	16 20.5	16 13.8	59 52.6	− 1.93	59 28.2	− 2.08	1 57.4	+ 2.31	2.0
8	16 06.6	15 59.1	59 01.7	2.20	58 34.1	2.33	2 50.9	2.16	3.0
9	15 51.4	15 43.7	58 05.9	2.36	57 37.7	2.33	3 41.3	2.04	4.0
10	15 36.2	15 29.0	57 10.0	− 2.26	56 43.5	− 2.15	4 29.2	+ 1.96	5.0
11	15 22.1	15 15.8	56 18.3	2.02	55 54.9	1.87	5 15.5	1.91	6.0
12	15 09.9	15 04.7	55 33.5	1.69	55 14.3	1.50	6 01.0	1.89	7.0
13	15 00.0	14 56.1	54 57.4	− 1.31	54 42.8	− 1.11	6 46.3	+ 1.90	8.0
14	14 52.8	14 50.1	54 30.6	0.92	54 20.7	0.73	7 32.0	1.92	9.0
15	14 48.0	14 46.6	54 13.2	0.53	54 07.8	0.37	8 18.4	1.95	10.0
16	14 45.7	14 45.4	54 04.6	− 0.18	54 03.4	− 0.02	9 05.5	+ 1.98	11.0
17	14 45.5	14 46.2	54 04.1	+ 0.13	54 06.5	+ 0.28	9 53.2	1.99	12.0
18	14 47.3	14 48.8	54 10.6	0.40	54 16.1	0.52	10 41.2	2.00	13.0
19	14 50.7	14 52.9	54 23.0	+ 0.62	54 31.1	+ 0.72	11 29.0	+ 1.99	14.0
20	14 55.4	14 58.2	54 40.3	0.82	54 50.6	0.88	12 16.4	1.96	15.0
21	15 01.2	15 04.5	55 01.7	0.95	55 13.7	1.05	13 03.2	1.94	16.0
22	15 08.0	15 11.7	55 26.5	+ 1.10	55 40.1	+ 1.15	13 49.4	+ 1.92	17.0
23	15 15.6	15 19.7	55 54.3	1.22	56 09.4	1.28	14 35.5	1.92	18.0
24	15 24.0	15 28.4	56 25.0	1.33	56 41.4	1.39	15 21.9	1.95	19.0
25	15 33.0	15 37.8	56 58.4	+ 1.44	57 15.9	+ 1.49	16 09.2	+ 2.01	20.0
26	15 42.7	15 47.8	57 34.0	1.52	57 52.5	1.54	16 58.3	2.09	21.0
27	15 52.9	15 58.0	58 11.2	1.56	58 29.9	1.55	17 49.8	2.20	22.0
28	16 03.0	16 08.0	58 48.5	+ 1.53	59 06.6	+ 1.47	18 44.2	+ 2.33	23.0
29	16 12.7	16 17.0	59 23.9	1.39	59 39.9	1.26	19 41.6	2.44	24.0
30	16 21.0	16 24.3	59 54.3	1.10	60 06.6	0.92	20 41.4	2.52	25.0
31	16 27.0	16 28.9	60 16.4	+ 0.69	60 23.3	+ 0.44	21 42.3	+ 2.53	26.0
32	16 29.8	16 29.9	60 26.9	+ 0.15	60 27.0	− 0.14	22 42.7	+ 2.48	27.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 1. / THURSDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 40 07.06	+ 2.4279	N.14 38 55.0	+7.971	0	4 42 24.83	+ 2.6440	N.18 59 14.3	+ 2.438
1	2 42 32.90	2.4335	14 46 50.7	7.885	1	4 45 03.55	2.6465	19 01 36.4	2.298
2	2 44 59.08	2.4391	14 54 41.2	7.797	2	4 47 42.41	2.6489	19 03 50.1	2.158
3	2 47 25.59	2.4446	15 02 26.3	7.707	3	4 50 21.42	2.6512	19 05 55.4	2.017
4	2 49 52.43	2.4501	15 10 06.1	7.617	4	4 53 00.56	2.6534	19 07 52.2	1.876
5	2 52 19.60	2.4556	15 17 40.4	7.526	5	4 55 39.83	2.6555	19 09 40.5	1.734
6	2 54 47.10	2.4611	15 25 09.2	7.432	6	4 58 19.22	2.6575	19 11 20.3	1.592
7	2 57 14.93	2.4665	15 32 32.3	7.337	7	5 00 58.73	2.6593	19 12 51.6	1.450
8	2 59 43.08	2.4719	15 39 49.7	7.242	8	5 03 38.34	2.6610	19 14 14.3	1.307
9	3 02 11.56	2.4773	15 47 01.4	7.146	9	5 06 18.05	2.6627	19 15 28.4	1.162
10	3 04 40.36	2.4827	15 54 07.2	7.047	10	5 08 57.86	2.6642	19 16 33.8	1.018
11	3 07 09.48	2.4880	16 01 07.1	6.947	11	5 11 37.75	2.6655	19 17 30.6	0.875
12	3 09 38.92	2.4933	16 08 00.9	6.846	12	5 14 17.72	2.6667	19 18 18.8	0.731
13	3 12 08.68	2.4987	16 14 48.6	6.744	13	5 16 57.76	2.6678	19 18 58.3	0.586
14	3 14 38.76	2.5039	16 21 30.2	6.641	14	5 19 37.86	2.6687	19 19 29.1	0.440
15	3 17 09.15	2.5091	16 28 05.5	6.535	15	5 22 18.01	2.6696	19 19 51.1	0.295
16	3 19 39.85	2.5142	16 34 34.4	6.428	16	5 24 58.21	2.6703	19 20 04.5	0.150
17	3 22 10.86	2.5194	16 40 56.9	6.322	17	5 27 38.45	2.6709	19 20 09.1	+ 0.004
18	3 24 42.18	2.5245	16 47 13.0	6.213	18	5 30 18.72	2.6714	19 20 05.0	− 0.141
19	3 27 13.80	2.5294	16 53 22.5	6.103	19	5 32 59.02	2.6718	19 19 52.2	0.286
20	3 29 45.71	2.5344	16 59 25.4	5.992	20	5 35 39.34	2.6720	19 19 30.7	0.432
21	3 32 17.93	2.5394	17 05 21.5	5.878	21	5 38 19.66	2.6720	19 19 00.4	0.577
22	3 34 50.44	2.5442	17 11 10.8	5.765	22	5 40 59.98	2.6720	19 18 21.4	0.722
23	3 37 23.24	+ 2.5490	N.17 16 53.3	+ 5.651	23	5 43 40.30	+ 2.6718	N.19 17 33.7	− 0.868

WEDNESDAY 2. / FRIDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 39 56.32	+ 2.5537	N.17 22 28.9	+ 5.535	0	5 46 20.60	+ 2.6715	N.19 16 37.2	− 1.014
1	3 42 29.69	2.5585	17 27 57.5	5.417	1	5 49 00.88	2.6711	19 15 32.0	1.159
2	3 45 03.34	2.5631	17 33 19.0	5.298	2	5 51 41.13	2.6705	19 14 18.1	1.304
3	3 47 37.26	2.5677	17 38 33.3	5.178	3	5 54 21.34	2.6698	19 12 55.5	1.449
4	3 50 11.46	2.5722	17 43 40.4	5.058	4	5 57 01.51	2.6691	19 11 24.2	1.593
5	3 52 45.92	2.5766	17 48 40.3	4.937	5	5 59 41.63	2.6681	19 09 44.3	1.737
6	3 55 20.65	2.5809	17 53 32.8	4.813	6	6 02 21.68	2.6670	19 07 55.7	1.882
7	3 57 55.63	2.5851	17 58 17.9	4.689	7	6 05 01.67	2.6658	19 05 58.5	2.025
8	4 00 30.86	2.5893	18 02 55.5	4.564	8	6 07 41.58	2.6645	19 03 52.7	2.167
9	4 03 06.35	2.5935	18 07 25.6	4.438	9	6 10 21.41	2.6631	19 01 38.4	2.310
10	4 05 42.08	2.5974	18 11 48.1	4.312	10	6 13 01.15	2.6615	18 59 15.5	2.452
11	4 08 18.04	2.6013	18 16 03.0	4.184	11	6 15 40.79	2.6598	18 56 44.1	2.593
12	4 10 54.24	2.6052	18 20 10.2	4.055	12	6 18 20.33	2.6580	18 54 04.3	2.734
13	4 13 30.67	2.6090	18 24 09.6	3.924	13	6 20 59.75	2.6561	18 51 16.0	2.876
14	4 16 07.32	2.6127	18 28 01.1	3.792	14	6 23 39.06	2.6540	18 48 19.2	3.016
15	4 18 44.19	2.6162	18 31 44.7	3.661	15	6 26 18.23	2.6518	18 45 14.1	3.155
16	4 21 21.27	2.6197	18 35 20.4	3.528	16	6 28 57.28	2.6496	18 42 00.6	3.294
17	4 23 58.56	2.6232	18 38 48.1	3.394	17	6 31 36.18	2.6472	18 38 38.8	3.432
18	4 26 36.05	2.6264	18 42 07.7	3.260	18	6 34 14.94	2.6447	18 35 08.8	3.569
19	4 29 13.73	2.6296	18 45 19.3	3.125	19	6 36 53.54	2.6420	18 31 30.5	3.706
20	4 31 51.60	2.6327	18 48 22.7	2.989	20	6 39 31.98	2.6392	18 27 44.1	3.841
21	4 34 29.65	2.6357	18 51 18.0	2.852	21	6 42 10.25	2.6364	18 23 49.6	3.976
22	4 37 07.88	2.6385	18 54 05.0	2.715	22	6 44 48.35	2.6335	18 19 47.0	4.110
23	4 39 46.27	2.6412	18 56 43.8	2.577	23	6 47 26.27	2.6304	18 15 36.4	4.243
24	4 42 24.83	+ 2.6440	N.18 59 14.3	+ 2.438	24	6 50 04.00	+ 2.6272	N.18 11 17.8	− 4.376

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 5.					**MONDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 50 04.00	+ 2.6272	N.18 11 17.8	−4.376	0	8 51 04.43	+ 2.3956	N.12 30 55.5	−9.289
1	6 52 41.54	2.6240	18 06 51.3	4.507	1	8 53 28.00	2.3900	12 21 36.1	9.357
2	6 55 18.88	2.6207	18 02 16.9	4.638	2	8 55 51.23	2.3844	12 12 12.6	9.424
3	6 57 56.02	2.6172	17 57 34.7	4.767	3	8 58 14.13	2.3788	12 02 45.2	9.488
4	7 00 32.95	2.6137	17 52 44.8	4.896	4	9 00 36.69	2.3732	11 53 14.0	9.552
5	7 03 09.66	2.6100	17 47 47.2	5.023	5	9 02 58.92	2.3677	11 43 39.0	9.614
6	7 05 46.15	2.6062	17 42 42.0	5.149	6	9 05 20.82	2.3622	11 34 00.3	9.675
7	7 08 22.41	2.6024	17 37 29.3	5.274	7	9 07 42.38	2.3566	11 24 18.0	9.734
8	7 10 58.44	2.5986	17 32 09.1	5.399	8	9 10 03.61	2.3511	11 14 32.2	9.791
9	7 13 34.24	2.5946	17 26 41.4	5.522	9	9 12 24.51	2.3455	11 04 43.1	9.847
10	7 16 09.79	2.5904	17 21 06.4	5.644	10	9 14 45.07	2.3400	10 54 50.6	9.902
11	7 18 45.09	2.5862	17 15 24.1	5.765	11	9 17 05.31	2.3346	10 44 54.9	9.955
12	7 21 20.14	2.5820	17 09 34.6	5.885	12	9 19 25.22	2.3291	10 34 56.0	10.007
13	7 23 54.93	2.5777	17 03 37.9	6.003	13	9 21 44.80	2.3236	10 24 54.0	10.057
14	7 26 29.46	2.5733	16 57 34.2	6.120	14	9 24 04.05	2.3182	10 14 49.1	10.106
15	7 29 03.73	2.5689	16 51 23.5	6.236	15	9 26 22.98	2.3128	10 04 41.3	10.153
16	7 31 37.73	2.5643	16 45 05.9	6.351	16	9 28 41.59	2.3074	9 54 30.7	10.200
17	7 34 11.45	2.5597	16 38 41.4	6.464	17	9 30 59.87	2.3020	9 44 17.3	10.246
18	7 36 44.89	2.5550	16 32 10.2	6.576	18	9 33 17.83	2.2967	9 34 01.2	10.289
19	7 39 18.05	2.5502	16 25 32.3	6.687	19	9 35 35.47	2.2914	9 23 42.6	10.331
20	7 41 50.92	2.5455	16 18 47.7	6.797	20	9 37 52.80	2.2862	9 13 21.5	10.372
21	7 44 23.51	2.5407	16 11 56.6	6.905	21	9 40 09.81	2.2809	9 02 58.0	10.411
22	7 46 55.80	2.5357	16 04 59.1	7.012	22	9 42 26.51	2.2757	8 52 32.2	10.449
23	7 49 27.80	+ 2.5307	N.15 57 55.2	−7.117	23	9 44 42.90	+ 2.2705	N. 8 42 04.1	− 10.486
	SUNDAY 6.					**TUESDAY 8.**			
0	7 51 59.49	+ 2.5257	N.15 50 45.0	−7.222	0	9 46 58.97	+ 2.2653	N. 8 31 33.9	−10.521
1	7 54 30.88	2.5206	15 43 28.6	7.324	1	9 49 14.74	2.2602	8 21 01.6	10.555
2	7 57 01.96	2.5155	15 36 06.1	7.426	2	9 51 30.20	2.2552	8 10 27.3	10.588
3	7 59 32.74	2.5104	15 28 37.5	7.526	3	9 53 45.36	2.2502	7 59 51.0	10.620
4	8 02 03.21	2.5052	15 21 03.0	7.624	4	9 56 00.22	2.2452	7 49 12.9	10.650
5	8 04 33.36	2.4999	15 13 22.6	7.721	5	9 58 14.78	2.2402	7 38 33.0	10.679
6	8 07 03.20	2.4947	15 05 36.5	7.817	6	10 00 29.04	2.2352	7 27 51.4	10.707
7	8 09 32.72	2.4893	14 57 44.6	7.912	7	10 02 43.01	2.2304	7 17 08.2	10.733
8	8 12 01.92	2.4840	14 49 47.1	8.004	8	10 04 56.69	2.2256	7 06 23.4	10.758
9	8 14 30.80	2.4786	14 41 44.1	8.096	9	10 07 10.08	2.2207	6 55 37.2	10.782
10	8 16 59.35	2.4732	14 33 35.6	8.186	10	10 09 23.18	2.2160	6 44 49.6	10.805
11	8 19 27.58	2.4678	14 25 21.8	8.274	11	10 11 36.00	2.2112	6 34 00.6	10.827
12	8 21 55.49	2.4624	14 17 02.7	8.362	12	10 13 48.53	2.2066	6 23 10.4	10.847
13	8 24 23.07	2.4568	14 08 38.4	8.447	13	10 16 00.79	2.2020	6 12 19.0	10.866
14	8 26 50.31	2.4512	14 00 09.1	8.531	14	10 18 12.77	2.1973	6 01 26.5	10.884
15	8 29 17.22	2.4457	13 51 34.7	8.613	15	10 20 24.47	2.1928	5 50 32.9	10.901
16	8 31 43.80	2.4402	13 42 55.5	8.694	16	10 22 35.91	2.1884	5 39 38.4	10.916
17	8 34 10.05	2.4347	13 34 11.4	8.774	17	10 24 47.08	2.1840	5 28 43.0	10.931
18	8 36 35.97	2.4292	13 25 22.6	8.852	18	10 26 57.99	2.1796	5 17 46.7	10.944
19	8 39 01.55	2.4236	13 16 29.2	8.928	19	10 29 08.63	2.1752	5 06 49.7	10.956
20	8 41 26.80	2.4180	13 07 31.2	9.004	20	10 31 19.01	2.1709	4 55 52.0	10.967
21	8 43 51.71	2.4124	12 58 28.7	9.077	21	10 33 29.14	2.1667	4 44 53.6	10.978
22	8 46 16.29	2.4068	12 49 21.9	9.149	22	10 35 39.01	2.1624	4 33 54.6	10.987
23	8 48 40.53	2.4012	12 40 10.8	9.220	23	10 37 48.63	2.1583	4 22 55.2	10.994
24	8 51 04.43	+ 2.3956	N.12 30 55.5	−9.289	24	10 39 58.01	+ 2.1542	N. 4 11 55.3	− 11.002

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 9.					**FRIDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 39 58.01	+ 2.1542	N. 4 11 55.3	− 11.002	0	12 19 38.82	+ 2.0195	S. 4 26 10.8	− 10.270
1	10 42 07.14	2.1502	4 00 55.0	11.007	1	12 21 39.94	2.0180	4 36 26.0	10.237
2	10 44 16.03	2.1462	3 49 54.4	11.012	2	12 23 40.98	2.0166	4 46 39.2	10.203
3	10 46 24.68	2.1422	3 38 53.6	11.015	3	12 25 41.93	2.0151	4 56 50.4	10.168
4	10 48 33.10	2.1383	3 27 52.6	11.018	4	12 27 42.79	2.0137	5 06 59.4	10.133
5	10 50 41.28	2.1345	3 16 51.4	11.020	5	12 29 43.57	2.0123	5 17 06.3	10.097
6	10 52 49.24	2.1307	3 05 50.2	11.020	6	12 31 44.27	2.0111	5 27 11.0	10.059
7	10 54 56.97	2.1269	2 54 49.0	11.020	7	12 33 44.90	2.0099	5 37 13.4	10.022
8	10 57 04.47	2.1232	2 43 47.8	11.019	8	12 35 45.46	2.0087	5 47 13.6	9.985
9	10 59 11.76	2.1197	2 32 46.7	11.017	9	12 37 45.95	2.0076	5 57 11 6	9.947
10	11 01 18.83	2.1161	2 21 45.8	11.013	10	12 39 46.37	2.0065	6 07 07.2	9.907
11	11 03 25.69	2.1126	2 10 45.2	11.008	11	12 41 46.73	2.0054	6 17 00.4	9.867
12	11 05 32.34	2.1091	1 59 44.8	11.003	12	12 43 47.02	2.0044	6 26 51.2	9.827
13	11 07 38.78	2.1057	1 48 44.8	10.998	13	12 45 47.26	2.0035	6 36 39.6	9.786
14	11 09 45.02	2.1022	1 37 45.1	10.992	14	12 47 47.44	2.0026	6 46 25.5	9.745
15	11 11 51.05	2.0989	1 26 45.8	10.983	15	12 49 47.57	2.0017	6 56 09.0	9.703
16	11 13 56.89	2.0957	1 15 47.1	10.974	16	12 51 47.65	2.0009	7 05 49.9	9.660
17	11 16 02.53	2.0925	1 04 48.9	10.964	17	12 53 47.68	2.0002	7 15 28.2	9.617
18	11 18 07.99	2.0894	0 53 51.4	10.953	18	12 55 47.67	1.9994	7 25 04.0	9.574
19	11 20 13.26	2.0862	0 42 54.5	10.942	19	12 57 47.61	1.9987	7 34 37.1	9.530
20	11 22 18.34	2.0832	0 31 58.3	10.930	20	12 59 47.52	1.9982	7 44 07.6	9.486
21	11 24 23.24	2.0802	0 21 02.9	10.917	21	13 01 47.39	1.9975	7 53 35.4	9.440
22	11 26 27.97	2.0773	N. 0 10 08.3	10.902	22	13 03 47.22	1.9969	8 03 00.4	9.394
23	11 28 32.52	+ 2.0743	S. 0 00 45.4	− 10.887	23	13 05 47.02	+ 1.9965	S. 8 12 22.7	− 9.348
	THURSDAY 10.					**SATURDAY 12.**			
0	11 30 36.89	+ 2.0715	S. 0 11 38.2	− 10.872	0	13 07 46.80	+ 1.9961	S. 8 21 42.2	− 9.302
1	11 32 41.10	2.0687	0 22 30.1	10.856	1	13 09 46.55	1.9956	8 30 58.9	9.254
2	11 34 45.14	2.0660	0 33 20.9	10.838	2	13 11 46.27	1.9952	8 40 12.7	9.207
3	11 36 49.02	2.0634	0 44 10.7	10.820	3	13 13 45.98	1.9949	8 49 23.7	9.159
4	11 38 52.75	2.0608	0 54 59.3	10.801	4	13 15 45.66	1.9945	8 58 31.8	9.110
5	11 40 56.32	2.0582	1 05 46.8	10.782	5	13 17 45.32	1.9942	9 07 36.9	9.060
6	11 42 59.73	2.0557	1 16 33.1	10.761	6	13 19 44.97	1.9941	9 16 39.0	9.010
7	11 45 03.00	2.0532	1 27 18.1	10.740	7	13 21 44.61	1.9939	9 25 38.1	8.960
8	11 47 06.12	2.0508	1 38 01.9	10.718	8	13 23 44.24	1.9937	9 34 34.2	8.909
9	11 49 09.10	2.0485	1 48 44.3	10.696	9	13 25 43.86	1.9937	9 43 27.2	8.858
10	11 51 11.94	2.0462	1 59 25.4	10.672	10	13 27 43.48	1.9936	9 52 17.2	8.807
11	11 53 14.64	2.0439	2 10 05.0	10.647	11	13 29 43.09	1.9935	10 01 04.0	8.754
12	11 55 17.21	2.0417	2 20 43.1	10.622	12	13 31 42.70	1.9935	10 09 47.7	8.702
13	11 57 19.65	2.0397	2 31 19.7	10.597	13	13 33 42.31	1.9936	10 18 28.2	8.648
14	11 59 21.97	2.0376	2 41 54.8	10.572	14	13 35 41.93	1.9937	10 27 05.5	8.595
15	12 01 24.16	2.0355	2 52 28.3	10.544	15	13 37 41.55	1.9938	10 35 39.6	8.541
16	12 03 26.23	2.0335	3 03 00.1	10.517	16	13 39 41.18	1.9939	10 44 10.4	8.486
17	12 05 28.18	2.0316	3 13 30.3	10.488	17	13 41 40.82	1.9941	10 52 37.9	8.431
18	12 07 30.02	2.0297	3 23 58.7	10.458	18	13 43 40.47	1.9943	11 01 02.1	8.376
19	12 09 31.75	2.0279	3 34 25.3	10.429	19	13 45 40.14	1.9946	11 09 23.0	8.320
20	12 11 33.37	2.0261	3 44 50.2	10.399	20	13 47 39.82	1.9948	11 17 40.5	8.263
21	12 13 34.88	2.0243	3 55 13.2	10.368	21	13 49 39.52	1.9952	11 25 54.6	8.206
22	12 15 36.29	2.0227	4 05 34.4	10.337	22	13 51 39.24	1.9955	11 34 05.2	8.148
23	12 17 37.60	2.0211	4 15 53.6	10.303	23	13 53 38.98	1.9959	11 42 12.4	8.091
24	12 19 38.82	+ 2.0195	S. 4 26 10.8	− 10.270	24	13 55 38.75	+ 1.9963	S. 11 50 16.1	− 8.032

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 13.					**TUESDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 55 38.75	+ 1.9963	S. 11 50 16.1	− 8.032	0	15 32 23.42	+ 2.0411	S. 17 00 48.5	− 4.755
1	13 57 38.54	1.9967	11 58 16.3	7.974	1	15 34 25.92	2.0422	17 05 31.5	4.677
2	13 59 38.36	1.9972	12 06 13.0	7.915	2	15 36 28.49	2.0435	17 10 09.8	4.600
3	14 01 38.20	1.9977	12 14 06.1	7.856	3	15 38 31.14	2.0447	17 14 43.5	4.522
4	14 03 38.08	1.9982	12 21 55.7	7.796	4	15 40 33.86	2.0459	17 19 12.5	4.444
5	14 05 37.99	1.9988	12 29 41.6	7.735	5	15 42 36.65	2.0471	17 23 36.8	4.365
6	14 07 37.94	1.9994	12 37 23.9	7.675	6	15 44 39.51	2.0483	17 27 56.3	4.286
7	14 09 37.92	2.0000	12 45 02.6	7.613	7	15 46 42.45	2.0496	17 32 11.1	4.207
8	14 11 37.94	2.0006	12 52 37.5	7.551	8	15 48 45.46	2.0507	17 36 21.1	4.127
9	14 13 37.99	2.0012	13 00 08.7	7.489	9	15 50 48.54	2.0519	17 40 26.3	4.047
10	14 15 38.09	2.0020	13 07 36.2	7.427	10	15 52 51.69	2.0532	17 44 26.7	3.967
11	14 17 38.23	2.0027	13 14 59.9	7.363	11	15 54 54.92	2.0543	17 48 22.3	3.887
12	14 19 38.41	2.0034	13 22 19.8	7.300	12	15 56 58.21	2.0555	17 52 13.1	3.806
13	14 21 38.64	2.0042	13 29 35.9	7.237	13	15 59 01.58	2.0567	17 55 59.0	3.724
14	14 23 38.91	2.0049	13 36 48.2	7.172	14	16 01 05.01	2.0578	17 59 40.0	3.642
15	14 25 39.23	2.0057	13 43 56.6	7.107	15	16 03 08.52	2.0591	18 03 16.1	3.561
16	14 27 39.60	2.0066	13 51 01.1	7.042	16	16 05 12.10	2.0602	18 06 47.3	3.479
17	14 29 40.02	2.0075	13 58 01.7	6.977	17	16 07 15.75	2.0613	18 10 13.6	3.397
18	14 31 40.50	2.0083	14 04 58.3	6.911	18	16 09 19.46	2.0625	18 13 34.9	3.314
19	14 33 41.02	2.0092	14 11 51.0	6.845	19	16 11 23.25	2.0637	18 16 51.3	3.232
20	14 35 41.60	2.0101	14 18 39.7	6.778	20	16 13 27.10	2.0647	18 20 02.7	3.148
21	14 37 42.23	2.0110	14 25 24.4	6.711	21	16 15 31.02	2.0659	18 23 09.1	3.065
22	14 39 42.92	2.0120	14 32 05.0	6.643	22	16 17 35.01	2.0670	18 26 10.5	2.982
23	14 41 43.67	+ 2.0129	S. 14 38 41.6	− 6.576	23	16 19 39.06	+ 2.0681	S. 18 29 06.9	− 2.897
	MONDAY 14.					**WEDNESDAY 16.**			
0	14 43 44.47	+ 2.0139	S. 14 45 14.1	− 6.507	0	16 21 43.18	+ 2.0692	S. 18 31 58.2	− 2.813
1	14 45 45.34	2.0149	14 51 42.5	6.439	1	16 23 47.36	2.0702	18 34 44.5	2.729
2	14 47 46.26	2.0159	14 58 06.8	6.370	2	16 25 51.61	2.0713	18 37 25.7	2.644
3	14 49 47.25	2.0170	15 04 26.9	6.300	3	16 27 55.92	2.0724	18 40 01.8	2.560
4	14 51 48.30	2.0180	15 10 42.8	6.230	4	16 30 00.30	2.0734	18 42 32.9	2.475
5	14 53 49.41	2.0191	15 16 54.5	6.160	5	16 32 04.73	2.0744	18 44 58.8	2.389
6	14 55 50.59	2.0202	15 23 02.0	6.090	6	16 34 09.23	2.0754	18 47 19.6	2.304
7	14 57 51.83	2.0212	15 29 05.3	6.018	7	16 36 13.78	2.0763	18 49 35.3	2.218
8	14 59 53.14	2.0223	15 35 04.2	5.947	8	16 38 18.39	2.0773	18 51 45.8	2.132
9	15 01 54.51	2.0234	15 40 58.9	5.876	9	16 40 23.06	2.0783	18 53 51.1	2.046
10	15 03 55.95	2.0246	15 46 49.3	5.803	10	16 42 27.79	2.0792	18 55 51.3	1.960
11	15 05 57.46	2.0257	15 52 35.3	5.730	11	16 44 32.57	2.0801	18 57 46.3	1.873
12	15 07 59.03	2.0268	15 58 16.9	5.657	12	16 46 37.40	2.0810	18 59 36.1	1.787
13	15 10 00.67	2.0280	16 03 54.2	5.584	13	16 48 42.29	2.0819	19 01 20.7	1.700
14	15 12 02.39	2.0292	16 09 27.0	5.510	14	16 50 47.23	2.0828	19 03 00.1	1.612
15	15 14 04.17	2.0302	16 14 55.4	5.437	15	16 52 52.23	2.0837	19 04 34.2	1.525
16	15 16 06.02	2.0314	16 20 19.4	5.362	16	16 54 57.28	2.0845	19 06 03.1	1.438
17	15 18 07.94	2.0327	16 25 38.9	5.287	17	16 57 02.37	2.0852	19 07 26.8	1.351
18	15 20 09.94	2.0338	16 30 53.9	5.212	18	16 59 07.51	2.0861	19 08 45.2	1.263
19	15 22 12.00	2.0350	16 36 04.4	5.137	19	17 01 12.70	2.0868	19 09 58.4	1.176
20	15 24 14.14	2.0362	16 41 10.4	5.062	20	17 03 17.93	2.0876	19 11 06.3	1.087
21	15 26 16.35	2.0374	16 46 11.8	4.985	21	17 05 23.21	2.0883	19 12 08.9	0.999
22	15 28 18.63	2.0387	16 51 08.6	4.909	22	17 07 28.53	2.0890	19 13 06.2	0.911
23	15 30 20.99	2.0399	16 56 00.9	4.832	23	17 09 33.89	2.0897	19 13 58.2	0.822
24	15 32 23.42	+ 2.0411	S. 17 00 48.5	− 4.755	24	17 11 39.30	+ 2.0904	S. 19 14 44.9	− 0.734

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 17.					**SATURDAY 19.**			
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 11 39.30	+2.0904	S.19 14 44.9	−0.734	0	18 52 17.39	+2.0932	S.18 07 27.7	+3.517
1	17 13 44.74	2.0910	19 15 26.3	0.645	1	18 54 22.97	2.0927	18 03 54.1	3.602
2	17 15 50.22	2.0916	19 16 02.3	0.557	2	18 56 28.51	2.0921	18 00 15.4	3.687
3	17 17 55.73	2.0922	19 16 33.1	0.468	3	18 58 34.02	2.0916	17 56 31.6	3.772
4	17 20 01.28	2.0927	19 16 58.5	0.379	4	19 00 39.50	2.0910	17 52 42.7	3.857
5	17 22 06.86	2.0932	19 17 18.6	0.290	5	19 02 44.94	2.0904	17 48 48.7	3.942
6	17 24 12.47	2.0938	19 17 33.3	0.201	6	19 04 50.35	2.0898	17 44 49.6	4.027
7	17 26 18.12	2.0944	19 17 42.7	0.112	7	19 06 55.72	2.0891	17 40 45.4	4.112
8	17 28 23.80	2.0948	19 17 46.7	−0.023	8	19 09 01.04	2.0884	17 36 36.2	4.195
9	17 30 29.50	2.0952	19 17 45.4	+0.067	9	19 11 06.33	2.0878	17 32 22.0	4.279
10	17 32 35.23	2.0957	19 17 38.7	0.156	10	19 13 11.58	2.0871	17 28 02.7	4.362
11	17 34 40.98	2.0961	19 17 26.7	0.244	11	19 15 16.78	2.0864	17 23 38.5	4.445
12	17 36 46.76	2.0965	19 17 09.4	0.333	12	19 17 21.95	2.0857	17 19 09.3	4.527
13	17 38 52.56	2.0968	19 16 46.7	0.423	13	19 19 27.07	2.0849	17 14 35.2	4.610
14	17 40 58.38	2.0971	19 16 18.6	0.513	14	19 21 32.14	2.0841	17 09 56.1	4.692
15	17 43 04.21	2.0974	19 15 45.1	0.603	15	19 23 37.16	2.0833	17 05 12.1	4.774
16	17 45 10.07	2.0977	19 15 06.2	0.692	16	19 25 42.14	2.0826	17 00 23.2	4.856
17	17 47 15.94	2.0979	19 14 22.0	0.782	17	19 27 47.07	2.0817	16 55 29.4	4.937
18	17 49 21.82	2.0982	19 13 32.4	0.871	18	19 29 51.95	2.0809	16 50 30.8	5.017
19	17 51 27.72	2.0984	19 12 37.5	0.960	19	19 31 56.78	2.0801	16 45 27.3	5.098
20	17 53 33.63	2.0986	19 11 37.2	1.050	20	19 34 01.56	2.0792	16 40 19.0	5.178
21	17 55 39.55	2.0987	19 10 31.5	1.139	21	19 36 06.29	2.0783	16 35 05.9	5.257
22	17 57 45.47	2.0987	19 09 20.5	1.228	22	19 38 10.96	2.0775	16 29 48.1	5.337
23	17 59 51.40	+2.0989	S.19 08 04.1	+1.317	23	19 40 15 59	+2.0767	S.16 24 25.5	+5.417
	FRIDAY 18.					**SUNDAY 20.**			
0	18 01 57.34	+2.0990	S.19 06 42.4	+1.407	0	19 42 20.16	+2.0757	S.16 18 58.1	+5.495
1	18 04 03.28	2.0990	19 05 15.3	1.496	1	19 44 24.68	2.0748	16 13 26.1	5.572
2	18 06 09.22	2.0991	19 03 42.9	1.585	2	19 46 29.14	2.0739	16 07 49.4	5.651
3	18 08 15.17	2.0991	19 02 05.1	1.674	3	19 48 33.55	2.0730	16 02 08.0	5.728
4	18 10 21.11	2.0990	19 00 22.0	1.763	4	19 50 37.90	2.0721	15 56 22.0	5.804
5	18 12 27.05	2.0989	18 58 33.5	1.852	5	19 52 42.20	2.0712	15 50 31.5	5.881
6	18 14 32.98	2.0988	18 56 39.7	1.942	6	19 54 46.44	2.0702	15 44 36.3	5.957
7	18 16 38.91	2.0987	18 54 40.5	2.030	7	19 56 50.62	2.0692	15 38 36.6	6.033
8	18 18 44.83	2.0986	18 52 36.1	2.118	8	19 58 54.75	2.0683	15 32 32.3	6.109
9	18 20 50.74	2.0985	18 50 26.3	2.207	9	20 00 58.82	2.0673	15 26 23.5	6.183
10	18 22 56.65	2.0983	18 48 11.2	2.295	10	20 03 02.83	2.0663	15 20 10.3	6.257
11	18 25 02.54	2.0980	18 45 50.9	2.383	11	20 05 06.78	2.0653	15 13 52.6	6.332
12	18 27 08.41	2.0977	18 43 25.2	2.472	12	20 07 10.67	2.0643	15 07 30.5	6.405
13	18 29 14.27	2.0976	18 40 54.2	2.560	13	20 09 14.50	2.0634	15 01 04.0	6.478
14	18 31 20.12	2.0973	18 38 18.0	2.647	14	20 11 18.28	2.0625	14 54 33.1	6.551
15	18 33 25.95	2.0970	18 35 36.5	2.735	15	20 13 22.00	2.0615	14 47 57.9	6.622
16	18 35 31.76	2.0967	18 32 49.8	2.823	16	20 15 25.66	2.0605	14 41 18.4	6.694
17	18 37 37.55	2.0963	18 29 57.8	2.911	17	20 17 29.26	2.0595	14 34 34.6	6.765
18	18 39 43.32	2.0959	18 27 00.5	2.997	18	20 19 32.80	2.0585	14 27 46.6	6.836
19	18 41 49.06	2.0955	18 23 58.1	3.084	19	20 21 36.28	2.0575	14 20 54.3	6.907
20	18 43 54.78	2.0952	18 20 50.4	3.172	20	20 23 39.70	2.0566	14 13 57.8	6.976
21	18 45 00.48	2.0947	18 17 37.5	3.258	21	20 25 43.07	2.0557	14 06 57.2	7.044
22	18 48 06.15	2.0942	18 14 19.4	3.345	22	20 27 46.38	2.0547	13 59 52.5	7.113
23	18 50 11.79	2.0937	18 10 56.1	3.431	23	20 29 49.63	2.0537	13 52 43.6	7.182
24	18 52 17.39	+2.0932	S.18 07 27.7	+3.517	24	20 31 52.83	+2.0527	S.13 45 30.7	+7.249

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 21.					**WEDNESDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 31 52.83	+ 2.0527	S.13 45 30.7	+ 7.249	0	22 09 31.32	+ 2.0231	S. 6 50 30.5	+ 9.805
1	20 33 55.96	2.0517	13 38 13.7	7.317	1	22 11 32.70	2.0230	6 40 41.1	9.842
2	20 35 59.04	2.0508	13 30 52.7	7.383	2	22 13 34.08	2.0230	6 30 49.4	9.879
3	20 38 02.06	2.0498	13 23 27.7	7.449	3	22 15 35.46	2.0231	6 20 55.6	9.915
4	20 40 05.02	2.0489	13 15 58.8	7.514	4	22 17 36.85	2.0232	6 10 59.6	9.951
5	20 42 07.93	2.0480	13 08 26.0	7.579	5	22 19 38.24	2.0232	6 01 01.5	9.985
6	20 44 10.78	2.0471	13 00 49.3	7.643	6	22 21 39.64	2.0233	5 51 01.4	10.019
7	20 46 13.58	2.0462	12 53 08.8	7.707	7	22 23 41.04	2.0235	5 40 59.2	10.052
8	20 48 16.32	2.0452	12 45 24.4	7.771	8	22 25 42.46	2.0237	5 30 55.1	10.085
9	20 50 19.00	2.0442	12 37 36.3	7.833	9	22 27 43.89	2.0239	5 20 49.0	10.117
10	20 52 21.63	2.0434	12 29 44.4	7.896	10	22 29 45.33	2.0242	5 10 41.1	10.147
11	20 54 24.21	2.0426	12 21 48.8	7.957	11	22 31 46.80	2.0246	5 00 31.3	10.178
12	20 56 26.74	2.0417	12 13 49.5	8.018	12	22 33 48.28	2.0249	4 50 19.7	10.207
13	20 58 29.21	2.0408	12 05 46.6	8.079	13	22 35 49.79	2.0253	4 40 06.4	10.236
14	21 00 31.63	2.0400	11 57 40.0	8.139	14	22 37 51.32	2.0257	4 29 51.4	10.264
15	21 02 34.01	2.0392	11 49 29.9	8.198	15	22 39 52.88	2.0262	4 19 34.7	10.292
16	21 04 36.33	2.0383	11 41 16.2	8.257	16	22 41 54.46	2.0267	4 09 16.4	10.318
17	21 06 38.60	2.0375	11 32 59.1	8.314	17	22 43 56.08	2.0272	3 58 56.5	10.344
18	21 08 40.83	2.0367	11 24 38.5	8.372	18	22 45 57.73	2.0278	3 48 35.1	10.369
19	21 10 43.01	2.0359	11 16 14.4	8.430	19	22 47 59.42	2.0285	3 38 12.2	10.393
20	21 12 45.14	2.0352	11 07 46.9	8.486	20	22 50 01.15	2.0292	3 27 47.9	10.417
21	21 14 47.23	2.0345	10 59 16.1	8.541	21	22 52 02.92	2.0298	3 17 22.2	10.440
22	21 16 49.28	2.0337	10 50 42.0	8.597	22	22 54 04.73	2.0306	3 06 55.1	10.462
23	21 18 51.28	+ 2.0330	S.10 42 04.5	+ 8.652	23	22 56 06.59	+ 2.0314	S. 2 56 26.7	+ 10.483
	TUESDAY 22.					**THURSDAY 24.**			
0	21 20 53.24	+ 2.0323	S.10 33 23.8	+ 8.705	0	22 58 08.50	+ 2.0322	S. 2 45 57.1	+ 10.504
1	21 22 55.16	2.0317	10 24 39.9	8.758	1	23 00 10.46	2.0331	2 35 26.2	10.524
2	21 24 57.04	2.0310	10 15 52.8	8.811	2	23 02 12.47	2.0340	2 24 54.2	10.542
3	21 26 58.88	2.0304	10 07 02.6	8.863	3	23 04 14.54	2.0350	2 14 21.1	10.561
4	21 29 00.69	2.0298	9 58 09.2	8.915	4	23 06 16.67	2.0360	2 03 46.9	10.579
5	21 31 02.46	2.0292	9 49 12.8	8.966	5	23 08 18.86	2.0370	1 53 11.6	10.596
6	21 33 04.19	2.0287	9 40 13.3	9.016	6	23 10 21.11	2.0381	1 42 35.4	10.611
7	21 35 05.90	2.0282	9 31 10.9	9.065	7	23 12 23.43	2.0392	1 31 58.3	10.626
8	21 37 07.57	2.0276	9 22 05.5	9.114	8	23 14 25.82	2.0404	1 21 20.3	10.641
9	21 39 09.21	2.0272	9 12 57.2	9.162	9	23 16 28.28	2.0416	1 10 41.4	10.655
10	21 41 10.83	2.0267	9 03 46.1	9.209	10	23 18 30.81	2.0428	1 00 01.7	10.667
11	21 43 12.42	2.0262	8 54 32.1	9.257	11	23 20 33.42	2.0442	0 49 21.3	10.679
12	21 45 13.98	2.0258	8 45 15.3	9.303	12	23 22 36.11	2.0455	0 38 40.2	10.690
13	21 47 15.52	2.0254	8 35 55.8	9.348	13	23 24 38.88	2.0469	0 27 58.5	10.700
14	21 49 17.03	2.0250	8 26 33.5	9.393	14	23 26 41.74	2.0484	0 17 16.2	10.710
15	21 51 18.52	2.0247	8 17 08.6	9.437	15	23 28 44.69	2.0499	S. 0 06 33.3	10.719
16	21 53 20.00	2.0245	8 07 41.0	9.481	16	23 30 47.73	2.0514	N. 0 04 10.1	10.727
17	21 55 21.46	2.0242	7 58 10.9	9.523	17	23 32 50.86	2.0530	0 14 53.9	10.733
18	21 57 22.90	2.0239	7 48 38.2	9.567	18	23 34 54.09	2.0547	0 25 38.1	10.740
19	21 59 24.33	2.0237	7 39 02.9	9.608	19	23 36 57.42	2.0563	0 36 22.7	10.746
20	22 01 25.74	2.0234	7 29 25.2	9.648	20	23 39 00.85	2.0581	0 47 07.6	10.750
21	22 03 27.14	2.0233	7 19 45.1	9.688	21	23 41 04.39	2.0598	0 57 52.7	10.753
22	22 05 28.54	2.0232	7 10 02.6	9.728	22	23 43 08.03	2.0616	1 08 38.0	10.757
23	22 07 29.93	2.0232	7 00 17.7	9.767	23	23 45 11.78	2.0635	1 19 23.5	10.758
24	22 09 31.32	+ 2.0231	S. 6 50 30.5	+ 9.805	24	23 47 15.65	+ 2.0654	N. 1 30 09.0	+ 10.759

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
	FRIDAY 25.					**SUNDAY 27.**			
0	23 47 15.65	+ 2.0654	N. 1 30 09.0	+ 10.759	0	1 29 30.54	+ 2.2126	N. 9 50 44.5	+ 9.728
1	23 49 19.63	2.0673	1 40 54.6	10.760	1	1 31 43.42	2.2167	10 00 26.8	9.682
2	23 51 23.73	2.0693	1 51 40.2	10.759	2	1 33 56.54	2.2208	10 10 06.3	9.634
3	23 53 27.95	2.0714	2 02 25.7	10.757	3	1 36 09.91	2.2250	10 19 42.9	9.586
4	23 55 32.30	2.0736	2 13 11.1	10.756	4	1 38 23.54	2.2292	10 29 16.6	9.537
5	23 57 36.78	2.0757	2 23 56.4	10.753	5	1 40 37.42	2.2334	10 38 47.3	9.487
6	23 59 41.39	2.0779	2 34 41.4	10.748	6	1 42 51.55	2.2377	10 48 15.0	9.435
7	0 01 46.13	2.0802	2 45 26.2	10.743	7	1 45 05.95	2.2422	10 57 39.5	9.382
8	0 03 51.01	2.0825	2 56 10.6	10.737	8	1 47 20.61	2.2465	11 07 00.9	9.329
9	0 05 56.03	2.0848	3 06 54.7	10.732	9	1 49 35.53	2.2508	11 16 19.0	9.273
10	0 08 01.19	2.0872	3 17 38.4	10.724	10	1 51 50.71	2.2552	11 25 33.7	9.217
11	0 10 06.50	2.0897	3 28 21.6	10.715	11	1 54 06.16	2.2597	11 34 45.1	9.161
12	0 12 11.95	2.0921	3 39 04.2	10.706	12	1 56 21.87	2.2642	11 43 53.0	9.102
13	0 14 17.55	2.0947	3 49 46.3	10.696	13	1 58 37.86	2.2687	11 52 57.4	9.042
14	0 16 23.31	2.0972	4 00 27.7	10.684	14	2 00 54.11	2.2732	12 01 58.1	8.982
15	0 18 29.22	2.0999	4 11 08.4	10.672	15	2 03 10.64	2.2777	12 10 55.2	8.921
16	0 20 35.30	2.1027	4 21 48.3	10.659	16	2 05 27.44	2.2823	12 19 48.6	8.858
17	0 22 41.54	2.1053	4 32 27.5	10.646	17	2 07 44.52	2.2870	12 28 38.2	8.794
18	0 24 47.94	2.1081	4 43 05.8	10.630	18	2 10 01.88	2.2916	12 37 23.9	8.729
19	0 26 54.51	2.1109	4 53 43.1	10.614	19	2 12 19.51	2.2962	12 46 05.7	8.663
20	0 29 01.25	2.1137	5 04 19.5	10.598	20	2 14 37.42	2.3008	12 54 43.5	8.596
21	0 31 08.16	2.1167	5 14 54.9	10.581	21	2 16 55.61	2.3054	13 03 17.2	8.527
22	0 33 15.25	2.1197	5 25 29.2	10.562	22	2 19 14.07	2.3101	13 11 46.8	8.457
23	0 35 22.52	+ 2.1227	N. 5 36 02.3	+ 10.542	23	2 21 32.82	+ 2.3149	N.13 20 12.1	+ 8.387
	SATURDAY 26.					**MONDAY 28.**			
0	0 37 29.97	+ 2.1257	N. 5 46 34.2	+ 10.522	0	2 23 51.86	+ 2.3197	N.13 28 33.2	+ 8.315
1	0 39 37.61	2.1288	5 57 04.9	10.500	1	2 26 11.18	2.3243	13 36 49.9	8.242
2	0 41 45.43	2.1319	6 07 34.2	10.477	2	2 28 30.78	2.3291	13 45 02.2	8.167
3	0 43 53.44	2.1352	6 18 02.1	10.453	3	2 30 50.67	2.3338	13 53 10.0	8.092
4	0 46 01.65	2.1385	6 28 28.6	10.430	4	2 33 10.84	2.3386	14 01 13.3	8.016
5	0 48 10.06	2.1417	6 38 53.7	10.405	5	2 35 31.30	2.3433	14 09 11.9	7.938
6	0 50 18.66	2.1451	6 49 17.2	10.378	6	2 37 52.04	2.3481	14 17 05.9	7.859
7	0 52 27.47	2.1485	6 59 39.0	10.350	7	2 40 13.07	2.3529	14 24 55.0	7.778
8	0 54 36.48	2.1518	7 09 59.2	10.322	8	2 42 34.39	2.3577	14 32 39.3	7.698
9	0 56 45.69	2.1553	7 20 17.6	10.292	9	2 44 56.00	2.3625	14 40 18.8	7.617
10	0 58 55.12	2.1589	7 30 34.2	10.262	10	2 47 17.89	2.3672	14 47 53.3	7.533
11	1 01 04.76	2.1624	7 40 49.0	10.231	11	2 49 40.06	2.3720	14 55 22.7	7.447
12	1 03 14.61	2.1660	7 51 01.9	10.198	12	2 52 02.53	2.3768	15 02 47.0	7.362
13	1 05 24.68	2.1697	8 01 12.8	10.165	13	2 54 25.28	2.3816	15 10 06.1	7.275
14	1 07 34.97	2.1734	8 11 21.7	10.130	14	2 56 48.32	2.3863	15 17 20.0	7.187
15	1 09 45.49	2.1772	8 21 28.4	10.094	15	2 59 11.64	2.3911	15 24 28.6	7.098
16	1 11 56.23	2.1808	8 31 33.0	10.058	16	3 01 35.25	2.3958	15 31 31.8	7.007
17	1 14 07.19	2.1847	8 41 35.4	10.021	17	3 03 59.14	2.4005	15 38 29.5	6.916
18	1 16 18.39	2.1886	8 51 35.5	9.982	18	3 06 23.31	2.4052	15 45 21.7	6.824
19	1 18 29.82	2.1925	9 01 33.2	9.942	19	3 08 47.77	2.4100	15 52 08.4	6.731
20	1 20 41.49	2.1964	9 11 28.5	9.902	20	3 11 12.51	2.4147	15 58 49.4	6.635
21	1 22 53.39	2.2003	9 21 21.4	9.860	21	3 13 37.54	2.4194	16 05 24.6	6.539
22	1 25 05.53	2.2043	9 31 11.7	9.817	22	3 16 02.84	2.4240	16 11 54.1	6.442
23	1 27 17.91	2.2084	9 40 59.4	9.773	23	3 18 28.42	2.4287	16 18 17.7	6.344
24	1 29 30.54	+ 2.2126	N. 9 50 44.5	+ 9.728	24	3 20 54.28	+ 2.4332	N.16 24 35.4	+ 6.245

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 29.					**THURSDAY 31.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 20 54.28	+2.4332	N.16 24 35.4	+6.245	0	5 22 08.25	+2.5922	N.19 11 45.4	+0.423
1	3 23 20.41	2.4378	16 30 47.1	6.145	1	5 24 43.82	2.5935	19 12 06.7	0.287
2	3 25 46.82	2.4425	16 36 52.8	6.043	2	5 27 19.47	2.5948	19 12 19.8	0.151
3	3 28 13.51	2.4470	16 42 52.3	5.941	3	5 29 55.20	2.5960	19 12 24.8	+0.014
4	3 30 40.46	2.4514	16 48 45.7	5.837	4	5 32 30.99	2.5970	19 12 21.5	− 0.123
5	3 33 07.68	2.4559	16 54 32.8	5.732	5	5 35 06.84	2.5980	19 12 10.0	0.260
6	3 35 35.17	2.4603	17 00 13.6	5.627	6	5 37 42.75	2.5988	19 11 50.3	0.397
7	3 38 02.92	2.4647	17 05 48.0	5.520	7	5 40 18.70	2.5995	19 11 22.4	0.534
8	3 40 30.94	2.4692	17 11 16.0	5.412	8	5 42 54.69	2.6002	19 10 46.2	0.672
9	3 42 59.22	2.4734	17 16 37.5	5.303	9	5 45 30.72	2.6008	19 10 01.8	0.808
10	3 45 27.75	2.4777	17 21 52.4	5.194	10	5 48 06.78	2.6012	19 09 09.2	0.946
11	3 47 56.54	2.4819	17 27 00.8	5.084	11	5 50 42.86	2.6014	19 08 08.3	1.083
12	3 50 25.58	2.4861	17 32 02.5	4.972	12	5 53 18.95	2.6017	19 06 59.2	1.220
13	3 52 54.87	2.4902	17 36 57.4	4.858	13	5 55 55.06	2.6018	19 05 41.9	1.357
14	3 55 24.41	2.4943	17 41 45.5	4.745	14	5 58 31.17	2.6018	19 04 16.3	1.494
15	3 57 54.19	2.4984	17 46 26.8	4.631	15	6 01 07.28	2.6017	19 02 42.6	1.631
16	4 00 24.22	2.5024	17 51 01.2	4.515	16	6 03 43.38	2.6015	19 01 00.6	1.767
17	4 02 54.48	2.5063	17 55 28.6	4.398	17	6 06 19.46	2.6012	18 59 10.5	1.903
18	4 05 24.98	2.5102	17 59 49.0	4.281	18	6 08 55.52	2.6008	18 57 12.2	2.040
19	4 07 55.71	2.5140	18 04 02.3	4.162	19	6 11 31.56	2.6003	18 55 05.7	2.177
20	4 10 26.66	2.5177	18 08 08.5	4.043	20	6 14 07.56	2.5997	18 52 51.0	2.312
21	4 12 57.84	2.5215	18 12 07.5	3.922	21	6 16 43.53	2.5991	18 50 28.2	2.447
22	4 15 29.24	2.5252	18 15 59.2	3.802	22	6 19 19.45	2.5982	18 47 57.3	2.582
23	4 18 00.86	+2.5287	N.18 19 43.7	+3.681	23	6 21 55.31	+2.5972	N.18 45 18.4	− 2.717
	WEDNESDAY 30.					**FRIDAY, AUGUST 1.**			
0	4 20 32.69	+2.5322	N.18 23 20.9	+3.558	0	6 24 31.12	+2.5963	N.18 42 31.3	− 2.852
1	4 23 04.73	2.5357	18 26 50.7	3.434					
2	4 25 36.97	2.5390	18 30 13.0	3.310					
3	4 28 09.41	2.5422	18 33 27.9	3.186					
4	4 30 42.04	2.5455	18 36 35.3	3.060					
5	4 33 14.87	2.5487	18 39 35.1	2.933					
6	4 35 47.88	2.5517	18 42 27.3	2.805			**PHASES OF THE MOON.**			
7	4 38 21.08	2.5547	18 45 11.8	2.678					
8	4 40 54.45	2.5576	18 47 48.7	2.550					
9	4 43 27.99	2.5604	18 50 17.8	2.421					
10	4 46 01.70	2.5632	18 52 39.2	2.292					
11	4 48 35.58	2.5659	18 54 52.8	2.162					
12	4 51 09.61	2.5683	18 56 58.6	2.031					
13	4 53 43.78	2.5708	18 58 56.5	1.899					
14	4 56 18.11	2.5733	19 00 46.5	1.767					
15	4 58 52.58	2.5757	19 02 28.5	1.634					
16	5 01 27.19	2.5779	19 04 02.6	1.502					
17	5 04 01.93	2.5800	19 05 28.7	1.368					
18	5 06 36.79	2.5820	19 06 46.7	1.233					
19	5 09 11.77	2.5839	19 07 56.7	1.100					
20	5 11 46.86	2.5857	19 08 58.7	0.966					
21	5 14 22.06	2.5875	19 09 52.6	0.830					
22	5 16 57.36	2.5892	19 10 38.3	0.694					
23	5 19 32.76	2.5907	19 11 15.9	0.559					
24	5 22 08.25	+2.5922	N.19 11 45.4	+0.423					

PHASES OF THE MOON.

			d	h	m
●	New Moon	July	5	00	59.2
☽	First Quarter		12	00	46.6
○	Full Moon		20	04	45.2
☾	Last Quarter		27	17	14.6

			d	h
☾	Perigee	July	4	02.2
☾	Apogee		16	13.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	SATURN	W.	106 30 11	2192	108 18 50	2181	110 07 46	2169	111 57 00	2157
	JUPITER	W.	85 55 21	2194	87 43 57	2181	89 32 53	2167	91 22 10	2155
	SUN	E.	56 30 17	2515	54 49 24	2502	53 08 13	2488	51 26 43	2475
2	JUPITER	W.	100 33 16	2096	102 24 21	2086	104 15 42	2076	106 07 18	2067
	SUN	E.	42 54 58	2420	41 11 52	2412	39 28 34	2404	37 45 05	2397
6	SUN	W.	14 23 10	2598	16 02 08	2575	17 41 37	2559	19 21 29	2547
	Spica	E.	85 22 00	2088	83 30 42	2099	81 39 41	2111	79 48 58	2123
7	SUN	W.	27 42 41	2555	29 22 38	2564	31 02 22	2576	32 41 50	2588
	Spica	E.	70 40 21	2192	68 51 42	2208	67 03 26	2223	65 15 33	2239
	Antares	E.	116 03 34	2238	114 16 03	2251	112 28 52	2266	110 42 03	2281
8	SUN	W.	40 54 28	2664	42 31 56	2681	44 09 01	2698	45 45 43	2716
	Spica	E.	56 22 17	2325	54 36 54	2343	52 51 57	2360	51 07 25	2379
	Antares	E.	101 53 41	2363	100 09 13	2381	98 25 11	2398	96 41 33	2416
9	SUN	W.	53 43 09	2810	55 17 24	2829	56 51 14	2848	58 24 40	2867
	Spica	E.	42 31 24	2472	40 49 31	2491	39 08 05	2510	37 27 05	2527
	Antares	E.	88 09 51	2508	86 28 49	2527	84 48 13	2545	83 08 02	2564
10	SUN	W.	66 05 40	2963	67 36 39	2982	69 07 14	3001	70 37 26	3018
	Regulus	W.	25 06 05	2701	26 42 44	2711	28 19 09	2721	29 55 21	2732
	Spica	E.	29 08 29	2621	27 30 02	2640	25 52 01	2657	24 14 24	2675
	Antares	E.	74 53 35	2657	73 15 58	2676	71 38 46	2694	70 01 58	2713
	SATURN	E.	121 39 27	2615	120 00 52	2632	118 22 41	2649	116 44 52	2666
	α Aquilæ	E.	123 27 48	3206	122 01 46	3204	120 35 42	3204	119 09 37	3204
11	SUN	W.	78 02 53	3107	79 30 54	3125	80 58 33	3141	82 25 53	3157
	Regulus	W.	37 52 32	2793	39 27 09	2807	41 01 28	2819	42 35 31	2831
	Antares	E.	62 04 00	2802	60 29 35	2819	58 55 32	2836	57 21 51	2853
	SATURN	E.	108 41 19	2746	107 05 40	2761	105 30 21	2775	103 55 21	2791
	α Aquilæ	E.	111 59 40	3221	110 33 56	3227	109 08 19	3233	107 42 49	3240
12	SUN	W.	89 37 50	3233	91 03 20	3247	92 28 34	3260	93 53 32	3274
	Regulus	W.	50 21 38	2894	51 54 04	2907	53 26 14	2918	54 58 10	2928
	Antares	E.	49 38 50	2936	48 07 17	2953	46 36 05	2969	45 05 13	2985
	SATURN	E.	96 05 03	2859	94 31 52	2871	92 58 58	2884	91 26 19	2897
	α Aquilæ	E.	100 37 36	3282	99 13 04	3292	97 48 43	3300	96 24 32	3311
	JUPITER	E.	116 25 10	2858	114 51 57	2870	113 19 00	2882	111 46 18	2893
13	SUN	W.	100 54 40	3333	102 18 13	3344	103 41 34	3353	105 04 44	3364
	Regulus	W.	62 34 29	2980	64 05 07	2989	65 35 34	2997	67 05 50	3005
	Spica	W.	8 48 11	2998	10 18 26	2999	11 48 40	3002	13 18 50	3007
	Antares	E.	37 35 58	3069	36 07 10	3086	34 38 43	3104	33 10 38	3124
	SATURN	E.	83 46 45	2950	82 15 30	2960	80 44 27	2969	79 13 36	2978
	α Aquilæ	E.	89 26 31	3361	88 03 30	3372	86 40 41	3381	85 18 03	3392
	JUPITER	E.	104 06 15	2945	102 34 53	2954	101 03 42	2962	99 32 42	2970
14	SUN	W.	111 57 54	3406	113 20 04	3413	114 42 06	3419	116 04 01	3426
	Regulus	W.	74 34 46	3041	76 04 08	3047	77 33 22	3052	79 02 30	3057

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Saturn	W.	113 46 32	2144	115 36 24	2132	117 26 34	2121	119 17 01	2111
	Jupiter	W.	93 11 46	2142	95 01 41	2130	96 51 55	2118	98 42 27	2107
	Sun	E.	49 44 55	2462	48 02 49	2451	46 20 27	2441	44 37 50	2430
2	Jupiter	W.	107 59 08	2059	109 51 10	2051	111 43 25	2044	113 35 51	2037
	Sun	E.	36 01 26	2391	34 17 39	2387	32 33 45	2383	30 49 46	2382
6	Sun	W.	21 01 37	2539	22 41 56	2538	24 22 17	2540	26 02 34	2548
	Spica	E.	77 58 34	2136	76 08 30	2149	74 18 46	2163	72 29 23	2177
7	Sun	W.	34 21 01	2602	35 59 53	2617	37 38 25	2632	39 16 37	2647
	Spica	E.	63 28 04	2256	61 41 00	2273	59 54 21	2289	58 08 06	2307
	Antares	E.	108 55 36	2297	107 09 32	2313	105 23 51	2329	103 38 34	2346
8	Sun	W.	47 22 02	2735	48 57 56	2754	50 33 24	2772	52 08 29	2791
	Spica	E.	49 23 20	2398	47 39 42	2416	45 56 30	2434	44 13 44	2453
	Antares	E.	94 58 21	2434	93 15 35	2453	91 33 15	2470	89 51 20	2489
9	Sun	W.	59 57 41	2887	61 30 17	2905	63 02 29	2924	64 34 17	2944
	Spica	E.	35 46 30	2547	34 06 22	2565	32 26 39	2583	30 47 21	2602
	Antares	E.	81 28 17	2583	79 48 58	2601	78 10 05	2620	76 31 37	2639
10	Sun	W.	72 07 16	3037	73 36 43	3055	75 05 48	3073	76 34 31	3090
	Regulus	W.	31 31 19	2743	33 07 02	2756	34 42 28	2768	36 17 38	2780
	Spica	E.	22 37 11	2695	21 00 24	2713	19 24 01	2730	17 48 01	2746
	Antares	E.	68 25 35	2731	66 49 36	2749	65 14 01	2766	63 38 49	2784
	Saturn	E.	115 07 26	2682	113 30 22	2698	111 53 40	2714	110 17 19	2730
	α Aquilæ	E.	117 43 33	3205	116 17 30	3207	114 51 29	3210	113 25 32	3214
11	Sun	W.	83 52 54	3173	85 19 35	3188	86 45 58	3204	88 12 03	3219
	Regulus	W.	44 09 18	2845	45 42 47	2858	47 16 00	2870	48 48 57	2883
	Antares	E.	55 48 32	2870	54 15 35	2887	52 42 59	2903	51 10 44	2920
	Saturn	E.	102 20 41	2805	100 46 20	2819	99 12 17	2832	97 38 31	2846
	α Aquilæ	E.	106 17 27	3248	104 52 15	3256	103 27 12	3265	102 02 19	3273
12	Sun	W.	95 18 14	3287	96 42 41	3299	98 06 54	3310	99 30 54	3322
	Regulus	W.	56 29 53	2940	58 01 21	2950	59 32 36	2960	61 03 39	2970
	Antares	E.	43 34 41	3001	42 04 30	3018	40 34 39	3034	39 05 08	3051
	Saturn	E.	89 53 56	2908	88 21 47	2920	86 49 53	2930	85 18 12	2941
	α Aquilæ	E.	95 00 33	3320	93 36 45	3331	92 13 09	3340	90 49 44	3351
	Jupiter	E.	110 13 50	2905	108 41 37	2915	107 09 37	2925	105 37 50	2935
13	Sun	W.	106 27 42	3372	107 50 30	3382	109 13 07	3390	110 35 35	3398
	Regulus	W.	68 35 56	3014	70 05 52	3022	71 35 38	3028	73 05 16	3034
	Spica	W.	14 48 54	3011	16 18 53	3016	17 48 46	3021	19 18 33	3026
	Antares	E.	31 42 57	3144	30 15 41	3166	28 48 51	3189	27 22 29	3215
	Saturn	E.	77 42 56	2986	76 12 26	2995	74 42 07	3002	73 11 57	3009
	α Aquilæ	E.	83 55 37	3402	82 33 23	3414	81 11 22	3423	79 49 32	3435
	Jupiter	E.	98 01 52	2979	96 31 13	2986	95 00 43	2993	93 30 22	3000
14	Sun	W.	117 25 48	3432	118 47 28	3438	120 09 02	3442	121 30 31	3445
	Regulus	W.	80 31 32	3062	82 00 28	3067	83 29 18	3071	84 58 03	3074

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
14	Spica　　　W.	20 48 13	3032	22 17 46	3037	23 47 13	3043	25 16 33	3047
	SATURN　　E.	71 41 56	3017	70 12 04	3022	68 42 19	3029	67 12 42	3034
	α Aquilæ　E.	78 27 55	3446	77 06 30	3457	75 45 18	3469	74 24 19	3480
	JUPITER　　E.	92 00 09	3006	90 30 04	3013	89 00 07	3018	87 30 16	3023
15	Regulus　　W.	86 26 44	3078	87 55 21	3081	89 23 54	3082	90 52 25	3085
	Spica　　　W.	32 41 58	3065	34 10 50	3068	35 39 39	3069	37 08 26	3072
	SATURN　　E.	59 46 14	3058	58 17 13	3061	56 48 16	3065	55 19 23	3068
	α Aquilæ　E.	67 42 46	3544	66 23 10	3557	65 03 49	3573	63 44 45	3587
	JUPITER　　E.	80 02 32	3044	78 33 14	3047	77 03 59	3050	75 34 48	3052
	α Pegasi　E.	114 46 07	3274	113 21 25	3273	111 56 42	3271	110 31 57	3269
16	Regulus　　W.	98 14 26	3091	99 42 47	3091	101 11 08	3091	102 39 29	3090
	Spica　　　W.	44 31 50	3077	46 00 28	3076	47 29 07	3076	48 57 46	3075
	SATURN　　E.	47 55 48	3078	46 27 12	3081	44 58 39	3082	43 30 08	3083
	α Aquilæ　E.	57 13 49	3677	55 56 38	3699	54 39 50	3723	53 23 27	3747
	JUPITER　　E.	68 09 26	3059	66 40 26	3060	65 11 27	3060	63 42 28	3060
	α Pegasi　E.	103 27 38	3260	102 02 40	3258	100 37 39	3256	99 12 36	3253
17	Regulus　　W.	110 01 29	3084	111 29 58	3082	112 58 30	3079	114 27 05	3078
	Spica　　　W.	56 21 21	3067	57 50 11	3065	59 19 03	3062	60 47 59	3059
	SATURN　　E.	36 07 54	3090	34 39 32	3091	33 11 12	3093	31 42 54	3096
	α Aquilæ　E.	47 08 45	3907	45 55 32	3948	44 43 01	3993	43 31 15	4043
	JUPITER　　E.	56 17 27	3056	54 48 24	3055	53 19 19	3053	51 50 12	3052
	α Pegasi　E.	92 06 42	3242	90 41 23	3241	89 16 02	3237	87 50 37	3235
18	Spica　　　W.	68 13 38	3042	69 42 59	3037	71 12 26	3032	72 41 59	3028
	Antares　　W.	23 45 38	3275	25 10 19	3246	26 35 34	3221	28 01 18	3198
	α Aquilæ　E.	37 46 22	4388	36 40 50	4484	35 36 44	4592	34 34 12	4712
	JUPITER　　E.	44 24 11	3044	42 54 53	3042	41 25 32	3040	39 56 09	3039
	α Pegasi　E.	80 42 49	3223	79 17 07	3220	77 51 22	3218	76 25 34	3215
	α Arietis　E.	124 11 23	3145	122 44 08	3137	121 16 43	3129	119 49 09	3122
19	Spica　　　W.	80 11 12	3001	81 41 23	2997	83 11 40	2990	84 42 05	2984
	Antares　　W.	35 15 52	3114	36 43 44	3101	38 11 52	3088	39 40 16	3077
	JUPITER　　E.	32 28 59	3038	30 59 33	3040	29 30 10	3042	28 00 49	3046
	α Pegasi　E.	69 15 58	3208	67 49 57	3206	66 23 55	3205	64 57 52	3204
	α Arietis　E.	112 29 03	3085	111 00 35	3078	109 31 59	3070	108 03 13	3063
20	Spica　　　W.	92 16 03	2954	93 47 14	2946	95 18 34	2939	96 50 03	2933
	Antares　　W.	47 05 44	3023	48 35 28	3013	50 05 25	3003	51 35 34	2994
	α Pegasi　E.	57 47 36	3209	56 21 37	3212	54 55 42	3215	53 29 51	3220
	α Arietis　E.	100 37 10	3027	99 07 31	3020	97 37 43	3012	96 07 45	3005
21	Spica　　　W.	104 29 37	2898	106 01 59	2890	107 34 31	2883	109 07 12	2875
	Antares　　W.	59 09 11	2948	60 40 29	2940	62 11 57	2931	63 43 37	2921
	α Pegasi　E.	46 22 18	3259	44 57 19	3272	43 32 35	3287	42 08 08	3305
	α Arietis　E.	88 35 44	2969	87 04 53	2962	85 33 53	2954	84 02 43	2948
	Aldebaran　E.	121 49 50	2901	120 17 32	2894	118 45 05	2886	117 12 28	2879
22	Antares　　W.	71 24 46	2878	72 57 33	2869	74 30 31	2861	76 03 40	2852
	SATURN　　W.	25 33 40	2898	27 06 02	2880	28 38 46	2865	30 11 50	2850

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Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVʰ.	P. L. of Diff.	XVIIIʰ.	P. L. of Diff.	XXIʰ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
14	Spica	W.	26 45 48	3052	28 14 57	3055	29 44 02	3059	31 13 02	3062
	SATURN	E.	65 43 12	3040	64 13 49	3045	62 44 32	3049	61 15 20	3054
	a Aquilæ	E.	73 03 33	3492	71 43 00	3505	70 22 41	3517	69 02 36	3531
	JUPITER	E.	86 00 32	3028	84 30 54	3033	83 01 22	3037	81 31 55	3040
15	Regulus	W.	92 20 53	3087	93 49 18	3088	95 17 42	3090	96 46 04	3090
	Spica	W.	38 37 10	3073	40 05 52	3075	41 34 32	3076	43 03 11	3077
	SATURN	E.	53 50 34	3070	52 21 48	3073	50 53 06	3075	49 24 26	3077
	a Aquilæ	E.	62 25 57	3603	61 07 26	3621	59 49 14	3638	58 31 21	3658
	JUPITER	E.	74 05 39	3054	72 36 33	3056	71 07 29	3057	69 38 27	3058
	a Pegasi	E.	109 07 09	3268	107 42 20	3265	106 17 28	3264	104 52 34	3262
16	Regulus	W.	104 07 51	3090	105 36 13	3088	107 04 37	3087	108 33 02	3086
	Spica	W.	50 26 26	3074	51 55 07	3073	53 23 49	3071	54 52 34	3069
	SATURN	E.	42 01 38	3085	40 33 10	3086	39 04 43	3087	37 36 18	3088
	a Aquilæ	E.	52 07 30	3774	50 52 01	3804	49 37 03	3835	48 22 37	3868
	JUPITER	E.	62 13 29	3060	60 44 30	3060	59 15 30	3058	57 46 29	3057
	a Pegasi	E.	97 47 30	3252	96 22 22	3250	94 57 12	3247	93 31 58	3245
17	Regulus	W.	115 55 42	3075	117 24 22	3072	118 53 06	3069	120 21 54	3065
	Spica	W.	62 16 59	3056	63 46 02	3053	65 15 09	3049	66 44 21	3045
	SATURN	E.	30 14 40	3099	28 46 29	3103	27 18 23	3107	25 50 22	3112
	a Aquilæ	E.	42 20 18	4099	41 10 15	4160	40 01 11	4228	38 53 11	4304
	JUPITER	E.	50 21 04	3051	48 51 54	3049	47 22 42	3047	45 53 28	3045
	a Pegasi	E.	86 25 09	3232	84 59 38	3231	83 34 05	3227	82 08 28	3225
18	Spica	W.	74 11 37	3023	75 41 21	3018	77 11 11	3013	78 41 08	3007
	Antares	W.	29 27 29	3178	30 54 04	3160	32 21 01	3144	33 48 17	3129
	a Aquilæ	E.	33 33 23	4849	32 34 27	5007	31 37 37	5186	30 43 05	5390
	JUPITER	E.	38 26 45	3038	36 57 19	3038	35 27 53	3037	33 58 26	3037
	a Pegasi	E.	74 59 43	3214	73 33 50	3212	72 07 55	3209	70 41 57	3209
	a Arietis	E.	118 21 26	3114	116 53 34	3107	115 25 33	3099	113 57 22	3092
19	Spica	W.	86 12 38	2978	87 43 18	2973	89 14 04	2966	90 44 59	2959
	Antares	W.	41 08 54	3065	42 37 46	3054	44 06 52	3043	45 36 12	3033
	JUPITER	E.	26 31 33	3052	25 02 25	3060	23 33 27	3070	22 04 41	3083
	a Pegasi	E.	63 31 48	3204	62 05 43	3205	60 39 40	3205	59 13 37	3207
	a Arietis	E.	106 34 18	3056	105 05 14	3049	103 36 02	3041	102 06 40	3034
20	Spica	W.	98 21 40	2926	99 53 26	2920	101 25 20	2912	102 57 24	2905
	Antares	W.	53 05 54	2985	54 36 26	2976	56 07 09	2966	57 38 04	2957
	a Pegasi	E.	52 04 05	3225	50 38 25	3231	49 12 53	3239	47 47 30	3248
	a Arietis	E.	94 37 39	2998	93 07 24	2991	91 37 00	2983	90 06 26	2977
21	Spica	W.	110 40 03	2868	112 13 03	2860	113 46 13	2852	115 19 33	2845
	Antares	W.	65 15 29	2913	66 47 31	2904	68 19 45	2895	69 52 10	2887
	a Pegasi	E.	40 44 02	3325	39 20 20	3349	37 57 05	3376	36 34 21	3409
	a Arietis	E.	82 31 25	2941	80 59 58	2934	79 28 22	2927	77 56 37	2920
	Aldebaran	E.	115 39 42	2871	114 06 46	2862	112 33 39	2855	111 00 22	2847
22	Antares	W.	77 37 01	2843	79 10 33	2835	80 44 16	2826	82 18 10	2817
	SATURN	W.	31 45 13	2836	33 18 54	2824	34 52 51	2811	36 27 05	2799

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		o ′ ″		o ′ ″		o ′ ″		o ′ ″	
22	a Pegasi E.	35 12 15	3447	33 50 52	3491	32 30 18	3543	31 10 41	3603
	a Arietis E.	76 24 44	2913	74 52 42	2906	73 20 31	2900	71 48 12	2893
	Aldebaran E.	109 26 55	2839	107 53 18	2831	106 19 30	2823	104 45 32	2815
23	Antares W.	83 52 16	2808	85 26 33	2799	87 01 02	2791	88 35 42	2782
	SATURN W.	38 01 34	2788	39 36 18	2775	41 11 18	2765	42 46 32	2753
	a Arietis E.	64 04 29	2862	62 31 21	2855	60 58 05	2849	59 24 41	2845
	Aldebaran E.	96 52 58	2772	95 17 54	2763	93 42 38	2755	92 07 11	2746
	VENUS E.	115 23 18	3202	113 57 11	3192	112 30 52	3182	111 04 21	3173
24	Antares W.	96 31 58	2737	98 07 49	2729	99 43 51	2719	101 20 05	2710
	SATURN W.	50 46 17	2701	52 22 56	2690	53 59 49	2680	55 36 56	2669
	a Arietis E.	51 36 05	2821	50 02 05	2818	48 28 00	2815	46 53 52	2813
	Aldebaran E.	84 06 59	2701	82 30 20	2692	80 53 29	2681	79 16 24	2672
	VENUS E.	103 48 53	3123	102 21 11	3113	100 53 17	3102	99 25 10	3092
25	Antares W.	109 24 20	2665	111 01 47	2655	112 39 27	2646	114 17 19	2637
	SATURN W.	63 46 05	2617	65 24 37	2606	67 03 24	2595	68 42 26	2585
	a Arietis E.	39 02 54	2818	37 28 49	2823	35 54 51	2830	34 21 02	2840
	Aldebaran E.	71 07 49	2624	69 29 26	2613	67 50 49	2603	66 11 58	2593
	VENUS E.	92 01 24	3039	90 31 59	3028	89 02 21	3016	87 32 28	3005
	SUN E.	123 52 07	2973	122 21 20	2962	120 50 19	2949	119 19 02	2938
26	SATURN W.	77 01 17	2530	78 41 48	2519	80 22 35	2508	82 03 37	2497
	JUPITER W.	57 17 34	2525	58 58 12	2514	60 39 06	2502	62 20 17	2489
	Aldebaran E.	57 54 13	2540	56 13 56	2530	54 33 25	2519	52 52 38	2508
	VENUS E.	79 59 36	2948	78 28 18	2937	76 56 46	2924	75 24 58	2912
	SUN E.	111 38 55	2878	110 06 08	2866	108 33 05	2853	106 59 46	2842
27	SATURN W.	90 32 43	2441	92 15 19	2429	93 58 12	2418	95 41 21	2407
	JUPITER W.	70 50 23	2431	72 33 14	2419	74 16 22	2407	75 59 47	2396
	a Pegasi W.	36 48 58	2964	38 19 56	2916	39 51 55	2871	41 24 51	2830
	Aldebaran E.	44 24 56	2453	42 42 37	2443	41 00 03	2432	39 17 14	2421
	VENUS E.	67 42 12	2853	66 08 53	2841	64 35 18	2829	63 01 28	2817
	SUN E.	99 09 15	2780	97 34 21	2767	95 59 10	2755	94 23 43	2742
28	SATURN W.	104 21 08	2351	106 05 53	2340	107 50 54	2329	109 36 11	2318
	JUPITER W.	84 41 02	2337	86 26 07	2326	88 11 29	2315	89 57 07	2303
	a Pegasi W.	49 21 36	2667	50 59 00	2640	52 37 00	2615	54 15 34	2591
	Aldebaran E.	30 39 18	2369	28 54 59	2359	27 10 25	2349	25 25 37	2341
	SUN E.	86 22 20	2681	84 45 15	2669	83 07 53	2657	81 30 15	2645
29	JUPITER W.	98 49 20	2250	100 36 34	2240	102 24 02	2230	104 11 46	2220
	a Pegasi W.	62 35 57	2492	64 17 21	2475	65 59 10	2458	67 41 23	2443
	SUN E.	73 18 05	2587	71 38 52	2577	69 59 25	2566	68 19 43	2555
30	JUPITER W.	113 13 53	2176	115 02 57	2168	116 52 13	2161	118 41 39	2154
	a Pegasi W.	76 17 34	2378	78 01 41	2366	79 46 04	2354	81 30 45	2344
	SUN E.	59 57 43	2507	58 16 40	2499	56 35 26	2491	54 54 00	2484
31	a Pegasi W.	90 17 15	2309	92 03 02	2303	93 48 57	2299	95 34 58	2296
	SUN E.	46 24 30	2454	44 42 12	2451	42 59 50	2448	41 17 23	2445

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVʰ.	P. L. of Diff.	XVIIIʰ.	P. L. of Diff.	XXIʰ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
22	a Pegasi	E.	29 52 10	3676	28 34 57	3762	27 19 15	3863	26 05 17	3984
	a Arietis	E.	70 15 44	2886	68 43 07	2880	67 10 23	2873	65 37 30	2867
	Aldebaran	E.	103 11 23	2806	101 37 03	2798	100 02 33	2789	98 27 51	2781
23	Antares	W.	90 10 34	2772	91 45 38	2765	93 20 52	2755	94 56 19	2746
	Saturn	W.	44 22 01	2744	45 57 43	2732	47 33 40	2722	49 09 51	2710
	a Arietis	E.	57 51 11	2839	56 17 34	2834	54 43 50	2829	53 10 00	2825
	Aldebaran	E.	90 31 32	2738	88 55 42	2729	87 19 40	2719	85 43 26	2710
	Venus	E.	109 37 39	3163	108 10 45	3153	106 43 40	3143	105 16 23	3133
24	Antares	W.	102 56 32	2701	104 33 10	2692	106 10 01	2683	107 47 04	2673
	Saturn	W.	57 14 18	2659	58 51 53	2648	60 29 43	2638	62 07 47	2627
	a Arietis	E.	45 19 41	2812	43 45 29	2811	42 11 16	2811	40 37 03	2815
	Aldebaran	E.	77 39 07	2663	76 01 37	2654	74 23 55	2643	72 45 59	2633
	Venus	E.	97 56 51	3082	96 28 20	3071	94 59 35	3060	93 30 36	3049
25	Antares	W.	115 55 24	2629	117 33 40	2619	119 12 09	2610	120 50 50	2600
	Saturn	W.	70 21 42	2574	72 01 13	2563	73 40 59	2552	75 21 00	2540
	a Arietis	E.	32 47 26	2854	31 14 08	2871	29 41 12	2893	28 08 44	2920
	Aldebaran	E.	64 32 54	2583	62 53 36	2572	61 14 03	2561	59 34 15	2551
	Venus	E.	86 02 22	2994	84 32 02	2983	83 01 28	2971	81 30 39	2960
	Sun	E.	117 47 31	2926	116 15 45	2914	114 43 44	2901	113 11 27	2890
26	Saturn	W.	83 44 55	2486	85 26 28	2475	87 08 17	2463	88 50 22	2452
	Jupiter	W.	64 01 45	2478	65 43 29	2466	67 25 30	2454	69 07 48	2442
	Aldebaran	E.	51 11 36	2497	49 30 19	2487	47 48 47	2475	46 06 59	2465
	Venus	E.	73 52 55	2901	72 20 37	2889	70 48 04	2877	69 15 16	2865
	Sun	E.	105 26 12	2829	103 52 22	2817	102 18 16	2805	100 43 54	2792
27	Saturn	W.	97 24 46	2396	99 08 27	2384	100 52 25	2373	102 36 39	2362
	Jupiter	W.	77 43 28	2384	79 27 26	2372	81 11 41	2360	82 56 13	2348
	a Pegasi	W.	42 58 40	2792	44 33 18	2757	46 08 42	2725	47 44 49	2695
	Aldebaran	E.	37 34 09	2410	35 50 48	2400	34 07 13	2389	32 23 23	2379
	Venus	E.	61 27 22	2805	59 53 00	2793	58 18 23	2781	56 43 30	2769
	Sun	E.	92 47 59	2730	91 11 59	2717	89 35 42	2705	87 59 09	2693
28	Saturn	W.	111 21 44	2308	113 07 32	2298	114 53 35	2287	116 39 54	2277
	Jupiter	W.	91 43 02	2293	93 29 12	2281	95 15 39	2270	97 02 22	2260
	a Pegasi	W.	55 54 41	2569	57 34 18	2549	59 14 23	2529	60 54 57	2510
	Aldebaran	E.	23 40 37	2334	21 55 27	2327	20 10 07	2320	18 24 36	2312
	Sun	E.	79 52 21	2633	78 14 11	2621	76 35 45	2610	74 57 03	2598
29	Jupiter	W.	105 59 44	2210	107 47 56	2201	109 36 22	2192	111 25 01	2184
	a Pegasi	W.	69 23 57	2428	71 06 52	2414	72 50 07	2400	74 33 42	2388
	Sun	E.	66 39 46	2545	64 59 35	2535	63 19 10	2526	61 38 33	2517
30	Jupiter	W.	120 31 16	2148	122 21 02	2141	124 10 58	2136	126 01 02	2132
	a Pegasi	W.	83 15 41	2336	85 00 48	2328	86 46 06	2320	88 31 36	2314
	Sun	E.	53 12 24	2477	51 30 38	2470	49 48 43	2465	48 06 40	2460
31	a Pegasi	W.	97 21 04	2294	99 07 13	2292	100 53 24	2291	102 39 37	2290
	Sun	E.	39 34 52	2444	37 52 20	2443	36 09 47	2444	34 27 15	2445

AT GREENWICH APPARENT NOON.

Day of the Week	Day of the Month	Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ' "	"	' "	s	m s	s
Frid.	1	8 42 49.32	+ 9.731	N.18 12 08.0	− 37.26	15 46.73	66.63	6 10.17	0.125
Sat.	2	8 46 42.56	9.706	17 57 04.7	38.00	15 46.85	66.54	6 06.86	0.150
SUN.	3	8 50 35.19	9.681	17 41 43.9	38.73	15 46.98	66.45	6 02.95	0.175
Mon.	4	8 54 27.23	+ 9.656	17 26 05.9	− 39.44	15 47.11	66.36	5 58.45	0.200
Tues.	5	8 58 18.66	9.630	17 10 10.9	40.14	15 47.25	66.27	5 53.34	0.226
Wed.	6	9 02 09.48	9.605	16 53 59.1	40.82	15 47.39	66.18	5 47.62	0.251
Thur.	7	9 05 59.69	+ 9.579	16 37 31.1	− 41.50	15 47.53	66.10	5 41.29	0.276
Frid.	8	9 09 49.29	9.554	16 20 47.1	42.16	15 47.68	66.01	5 34.35	0.301
Sat.	9	9 13 38.29	9.529	16 03 47.3	42.81	15 47.83	65.92	5 26.82	0.326
SUN.	10	9 17 26.69	+ 9.504	15 46 32.1	− 43.44	15 47.99	65.84	5 18.68	0.351
Mon.	11	9 21 14.49	9.479	15 29 01.7	44.07	15 48.15	65.76	5 09.96	0.376
Tues.	12	9 25 01.69	9.455	15 11 16.5	44.68	15 48.31	65.68	5 00.63	0.400
Wed.	13	9 28 48.32	+ 9.431	14 53 16.9	− 45.28	15 48.48	65.60	4 50.74	0.424
Thur.	14	9 32 34.38	9.408	14 35 03.1	45.87	15 48.65	65.52	4 40.28	0.448
Frid.	15	9 36 19.88	9.385	14 16 35.4	46.44	15 48.82	65.44	4 29.25	0.471
Sat.	16	9 40 04.83	+ 9.362	13 57 54.0	− 47.00	15 49.00	65.36	4 17.67	0.494
SUN.	17	9 43 49.24	9.340	13 38 59.5	47.54	15 49.18	65.28	4 05.56	0.516
Mon.	18	9 47 33.13	9.318	13 19 51.9	48.08	15 49.36	65.21	3 52.93	0.537
Tues.	19	9 51 16.49	+ 9.297	13 00 31.6	− 48.61	15 49.54	65.14	3 39.78	0.558
Wed.	20	9 54 59.37	9.276	12 40 58.9	49.11	15 49.73	65.07	3 26.14	0.578
Thur.	21	9 58 41.76	9.256	12 21 14.2	49.60	15 49.92	65.00	3 12.02	0.598
Frid.	22	10 02 23.70	+ 9.238	12 01 17.5	− 50.09	15 50.12	64.93	2 57.45	0.617
Sat.	23	10 06 05.19	9.220	11 41 09.5	50.57	15 50.32	64.86	2 42.42	0.635
SUN.	24	10 09 46.24	9.202	11 20 50.2	51.03	15 50.53	64.80	2 26.96	0.652
Mon.	25	10 13 26.88	+ 9.185	11 00 20.1	− 51.47	15 50.74	64.73	2 11.10	0.669
Tues.	26	10 17 07.13	9.169	10 39 39.4	51.91	15 50.95	64.67	1 54.84	0.686
Wed.	27	10 20 46.99	9.153	10 18 48.4	52.33	15 51.16	64.61	1 38.18	0.702
Thur.	28	10 24 26.48	+ 9.138	9 57 47.6	− 52.74	15 51.38	64.56	1 21.16	0.717
Frid.	29	10 28 05.62	9.123	9 36 37.1	53.13	15 51.60	64.50	1 03.80	0.731
Sat.	30	10 31 44.40	9.109	9 15 17.5	53.51	15 51.82	64.45	0 46.07	0.745
SUN.	31	10 35 22.86	9.096	8 53 49.0	53.87	15 52.04	64.40	0 28.03	0.758
Mon.	32	10 39 01.00	+ 9.083	N. 8 32 11.9	− 54.22	15 52.26	64.35	0 09.68	0.771

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting 0.18ˢ from the sidereal time. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week	Day of the Month	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	8 42 48.32	+9.731	N.18 12 11.8	− 37.26	6 10.18	+ 0.125	8 36 38.14
Sat.	2	8 46 41.57	9.706	17 57 08.6	38.00	6 06.88	0.150	8 40 34.69
SUN.	3	8 50 34.22	9.681	17 41 47.8	38.73	6 02.97	0.175	8 44 31.25
Mon.	4	8 54 26.27	+9.656	17 26 09.8	− 39.44	5 58.47	+ 0.200	8 48 27.80
Tues.	5	8 58 17.72	9.631	17 10 14.8	40.14	5 53.36	0.226	8 52 24.36
Wed.	6	9 02 08.55	9.606	16 54 03.0	40.82	5 47.64	0.251	8 56 20.91
Thur.	7	9 05 58.78	+9.580	16 37 35.0	− 41.50	5 41.32	+ 0.276	9 00 17.46
Frid.	8	9 09 48.40	9.555	16 20 50.9	42.16	5 34.38	0.301	9 04 14.02
Sat.	9	9 13 37.42	9.530	16 03 51.1	42.81	5 26.85	0.326	9 08 10.57
SUN.	10	9 17 25.84	+9.505	15 46 35.9	− 43.44	5 18.71	+ 0.351	9 12 07.13
Mon.	11	9 21 13.67	9.480	15 29 05.5	44.07	5 09.99	0.376	9 16 03.68
Tues.	12	9 25 00.90	9.456	15 11 20.3	44.68	5 00.66	0.400	9 20 00.24
Wed.	13	9 28 47.56	+9.432	14 53 20.6	− 45.28	4 50.77	+ 0.424	9 23 56.79
Thur.	14	9 32 33.65	9.409	14 35 06.7	45.87	4 40.31	0.448	9 27 53.34
Frid.	15	9 36 19.18	9.386	14 16 38.9	46.44	4 29.28	0.471	9 31 49.90
Sat.	16	9 40 04.16	+9.363	13 57 57.4	− 47.00	4 17.71	+ 0.494	9 35 46.45
SUN.	17	9 43 48.60	9.341	13 39 02.7	47.55	4 05.60	0.516	9 39 43.00
Mon.	18	9 47 32.52	9.319	13 19 55.0	48.09	3 52.96	0.537	9 43 39.56
Tues.	19	9 51 15.92	+9.298	13 00 34.6	− 48.61	3 39.81	+ 0.558	9 47 36.11
Wed.	20	9 54 58.84	9.278	12 41 01.7	49.12	3 26.17	0.578	9 51 32.67
Thur.	21	9 58 41.27	9.259	12 21 16.8	49.61	3 12.05	0.598	9 55 29.22
Frid.	22	10 02 23.25	+9.240	12 01 20.0	− 50.10	2 57.48	+ 0.617	9 59 25.77
Sat.	23	10 06 04.78	9.221	11 41 11.8	50.58	2 42.45	0.635	10 03 22.33
SUN.	24	10 09 45.87	9.204	11 20 52.3	51.04	2 26.99	0.652	10 07 18.88
Mon.	25	10 13 26.55	+9.187	11 00 22.0	− 51.48	2 11.12	+ 0.669	10 11 15.43
Tues.	26	10 17 06.84	9.171	10 39 41.1	51.92	1 54.86	0.686	10 15 11.98
Wed.	27	10 20 46.74	9.155	10 18 49.9	52.34	1 38.20	0.702	10 19 08.54
Thur.	28	10 24 26.27	+9.140	9 57 48.8	− 52.75	1 21.18	+ 0.717	10 23 05.09
Frid.	29	10 28 05.45	9.125	9 36 38.1	53.14	1 03.81	0.731	10 27 01.64
Sat.	30	10 31 44.28	9.111	9 15 18.2	53.52	0 46.08	0.745	10 30 58.20
SUN.	31	10 35 22.79	9.098	8 53 49.4	53.88	0 28.04	0.758	10 34 54.75
Mon.	32	10 39 00.98	+9.085	N. 8 32 12.0	− 54.23	0 09.68	+ 0.771	10 38 51.30

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,
+ 9.8565ˢ.
(Table III.)

		AT GREENWICH MEAN NOON.						

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE λ	λ'	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	213	128 17 01.7	16 22.8	143.58	− 0.24	0.006 4158	− 22.6	15 20 50.59
2	214	129 14 28.2	13 49.1	143.62	0.28	0.006 3603	23.6	15 16 54.68
3	215	130 11 55.7	11 16.5	143.66	0.29	0.006 3024	24.7	15 12 58.78
4	216	131 09 24.1	08 44.8	143.70	− 0.26	0.006 2419	− 25.7	15 09 02.87
5	217	132 06 53.5	06 14.1	143.74	0.19	0.006 1790	26.7	15 05 06.96
6	218	133 04 23.8	03 44.2	143.78	− 0.11	0.006 1138	27.7	15 01 11.05
7	219	134 01 54.9	01 15.2	143.82	0.00	0.006 0463	− 28.6	14 57 15.14
8	220	134 59 26.9	58 47.1	143.85	+ 0.12	0.005 9766	29.5	14 53 19.23
9	221	135 56 59.7	56 19.8	143.89	0.23	0.005 9049	30.3	14 49 23.32
10	222	136 54 33.4	53 53.3	143.92	+ 0.36	0.005 8314	− 31.0	14 45 27.41
11	223	137 52 07.9	51 27.7	143.96	0.48	0.005 7560	31.7	14 41 31.51
12	224	138 49 43.4	49 03.0	144.00	0.58	0.005 6791	32.4	14 37 35.60
13	225	139 47 19.7	46 39.3	144.04	+ 0.68	0.005 6006	− 33.0	14 33 39.69
14	226	140 44 57.1	44 16.6	144.08	0.74	0.005 5208	33.6	14 29 43.78
15	227	141 42 35.5	41 54.9	144.12	0.80	0.005 4396	34.1	14 25 47.87
16	228	142 40 15.0	39 34.2	144.17	+ 0.82	0.005 3573	− 34.6	14 21 51.97
17	229	143 37 55.6	37 14.8	144.22	0.81	0.005 2739	35.0	14 17 56.06
18	230	144 35 37.6	34 56.6	144.27	0.79	0.005 1894	35.4	14 14 00.15
19	231	145 33 20.7	32 39.6	144.33	+ 0.73	0.005 1039	− 35.8	14 10 04.24
20	232	146 31 05.3	30 24.1	144.39	0.64	0.005 0176	36.2	14 06 08.34
21	233	147 28 51.3	28 10.1	144.45	0.53	0.004 9303	36.6	14 02 12.43
22	234	148 26 38.9	25 57.6	144.52	+ 0.41	0.004 8421	− 37.0	13 58 16.52
23	235	149 24 28.2	23 46.7	144.59	0.28	9.004 7530	37.3	13 54 20.61
24	236	150 22 19.1	21 37.5	144.66	+ 0.14	0.004 6628	37.8	13 50 24.71
25	237	151 20 11.8	19 30.1	144.73	0.00	0.004 5716	− 38.3	13 46 28.80
26	238	152 18 06.3	17 24.6	144.81	− 0.11	0.004 4791	38.8	13 42 32.89
27	239	153 16 02.7	15 20.8	144.89	0.21	0.004 3852	39.4	13 38 36.99
28	240	154 14 00.9	13 18.9	144.96	− 0.27	0.004 2899	− 40.0	13 34 41.08
29	241	155 12 01.0	11 18.9	145.04	0.33	0.004 1930	40.7	13 30 45.17
30	242	156 10 02.9	09 20.7	145.11	0.34	0.004 0945	41.4	13 26 49.26
31	243	157 08 06.7	07 24.4	145.19	0.31	0.003 9942	42.2	13 22 53.36
32	244	158 06 12.1	05 29.8	145.26	− 0.26	0.003 8922	− 42.9	13 18 57.45

Diff. for 1 Hour,
− 9.8296ˢ.
(Table II.)

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' to the mean equinox of January 0.0ᵈ of the Besselian fictitious year.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 29.8	16 29.9	60 26.9	+ 0.15	60 27.0	− 0.14	22 42.7	+ 2.48	27.0
2	16 28.9	16 26.9	60 23.4	− 0.45	60 16.1	0.76	23 41.0	2.38	28.0
3	16 23.9	16 20.0	60 05.1	1.06	59 50.7	1.33	☾		29.0
4	16 15.2	16 09.7	59 33.1	− 1.58	59 12.8	− 1.78	0 36.7	+ 2.26	0.7
5	16 03.6	15 57.0	58 50.4	1.93	58 26.3	2.05	1 29.4	2.14	1.7
6	15 50.1	15 43.1	58 01.1	2.13	57 35.4	2.14	2 19.5	2.05	2.7
7	15 36.1	15 29.3	57 09.8	− 2.12	56 44.6	− 2.05	3 07.6	+ 1.98	3.7
8	15 22.7	15 16.5	56 20.4	1.95	55 57.7	1.83	3 54.5	1.94	4.7
9	15 10.7	15 05.5	55 36.6	1.68	55 17.5	1.50	4 40.8	1.93	5.7
10	15 00.9	14 57.0	55 00.6	− 1.31	54 46.0	− 1.11	5 27.0	+ 1.93	6.7
11	14 53.7	14 51.0	54 33.9	0.90	54 24.3	0.69	6 13.5	1.95	7.7
12	14·49.1	14 47.9	54 17.3	0.48	54 12.8	− 0.27	7 00.5	1.97	8.7
13	14 47.3	14 47.4	54 10.7	− 0.08	54 11.0	+ 0.12	7 48.0	+ 1.99	9.7
14	14 48.1	14 49.4	54 13.6	+ 0.30	54 18.3	0.47	8 35.8	1.99	10.7
15	14 51.2	14 53.5	54 25.0	0.63	54 33.4	0.77	9 23.7	1.99	11.7
16	14 56.3	14 59.4	54 43.4	+ 0.89	54 54.8	+ 1.00	10 11.4	+ 1.98	12.7
17	15 02.8	15 06.5	55 07.4	1.08	55 20.9	1.16	10 58.7	1.97	13.7
18	15 10.4	15 14.4	55 35.2	1.22	55 50.0	1.25	11 45.7	1.95	14.7
19	15 18.5	15 22.7	56 05.2	+ 1.27	56 20.5	+ 1.28	12 32.6	+ 1.95	15.7
20	15 26.9	15 31.1	56 36.0	1.28	56 51.2	1.26	13 19.6	1.97	16.7
21	15 35.2	15 39.2	57 06.2	1.24	57 20.9	1.21	14 07.3	2.01	17.7
22	15 43.1	15 46.8	57 35.2	+ 1.17	57 49.0	+ 1.13	14 56.3	+ 2.08	18.7
23	15 50.5	15 54.0	58 02.5	1.09	58 15.3	1.05	15 47.1	2.16	19.7
24	15 57.3	16 00.6	58 27.6	1.00	58 39.4	0.95	16 40.2	2.26	20.7
25	16 03.6	16 06.3	58 50.4	+ 0.88	59 00.7	+ 0.82	17 35.6	+ 2.36	21.7
26	16 08.9	16 11.2	59 10.1	0.74	59 18.4	0.65	18 33.2	2.42	22.7
27	16 13.1	16 14.7	59 25.6	0.53	59 31.3	0.41	19 31.9	2.45	23.7
28	16 15.8	16 16.5	59 35.4	+ 0.27	59 37.7	+ 0.11	20 30.6	+ 2.43	24.7
29	16 16.5	16 16.0	59 38.0	− 0.07	59 36.0	− 0.26	21 28.1	2.36	25.7
30	16 14.8	16 13.0	59 31.8	0.46	59 24.9	0.67	22 23.7	2.27	26.7
31	16 10.5	16 07.3	59 15.8	0.87	59 04.1	1.07	23 17.0	+ 2.17	27.7
32	16 03.5	15 59.1	58 50.1	− 1.26	58 34.0	− 1.42	☾		28.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 1.					SUNDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 24 31.12	+ 2.5963	N.18 42 31.3	− 2.852	0	8 26 17.64	+ 2.4507	N.14 04 35.1	− 8.350
1	6 27 06.87	2.5952	18 39 36.2	2.986	1	8 28 44.55	2.4463	13 56 11.5	8.437
2	6 29 42.54	2.5939	18 36 33.0	3.119	2	8 31 11.20	2.4419	13 47 42.7	8.522
3	6 32 18.14	2.5926	18 33 21.9	3.252	3	8 33 37.58	2.4374	13 39 08.9	8.605
4	6 34 53.65	2.5912	18 30 02.8	3.384	4	8 36 03.69	2.4329	13 30 30.1	8.688
5	6 37 29.08	2.5897	18 26 35.8	3.516	5	8 38 29.53	2.4284	13 21 46.3	8.770
6	6 40 04.41	2.5881	18 23 00.9	3.647	6	8 40 55.10	2.4239	13 12 57.7	8.850
7	6 42 39.65	2.5864	18 19 18.1	3.778	7	8 43 20.40	2.4194	13 04 04.3	8.928
8	6 45 14.78	2.5845	18 15 27.5	3.908	8	8 45 45.43	2.4148	12 55 06.3	9.005
9	6 47 49.79	2.5826	18 11 29.1	4.037	9	8 48 10.18	2.4102	12 46 03.7	9.081
10	6 50 24.69	2.5807	18 07 23.0	4.166	10	8 50 34.66	2.4057	12 36 56.6	9.156
11	6 52 59.47	2.5786	18 03 09.2	4.294	11	8 52 58.86	2.4011	12 27 45.0	9.230
12	6 55 34.12	2.5764	17 58 47.7	4.422	12	8 55 22.79	2.3965	12 18 29.0	9.302
13	6 58 08.64	2.5742	17 54 18.6	4.548	13	8 57 46.44	2.3918	12 09 08.8	9.371
14	7 00 43.02	2.5718	17 49 41.9	4.675	14	9 00 09.81	2.3872	11 59 44.5	9.439
15	7 03 17.25	2.5693	17 44 57.6	4.800	15	9 02 32.90	2.3825	11 50 16.1	9.507
16	7 05 51.34	2.5668	17 40 05.9	4.924	16	9 04 55.71	2.3779	11 40 43.7	9.572
17	7 08 25.27	2.5642	17 35 06.7	5.047	17	9 07 18.25	2.3733	11 31 07.4	9.637
18	7 10 59.04	2.5615	17 30 00.2	5.170	18	9 09 40.51	2.3687	11 21 27.2	9.701
19	7 13 32.65	2.5587	17 24 46.3	5.292	19	9 12 02.49	2.3640	11 11 43.3	9.762
20	7 16 06.09	2.5559	17 19 25.2	5.412	20	9 14 24.19	2.3593	11 01 55.7	9.822
21	7 18 39.36	2.5530	17 13 56.8	5.532	21	9 16 45.61	2.3547	10 52 04.6	9.882
22	7 21 12.45	2.5500	17 08 21.3	5.652	22	9 19 06.75	2.3501	10 42 09.9	9.939
23	7 23 45.36	+ 2.5469	N.17 02 38.6	− 5.770	23	9 21 27.62	+ 2.3455	N.10 32 11.9	− 9.995
	SATURDAY 2.					MONDAY 4.			
0	7 26 18.08	+ 2.5437	N.16 56 48.9	− 5.887	0	9 23 48.21	+ 2.3408	N.10 22 10.5	− 10.050
1	7 28 50.61	2.5405	16 50 52.2	6.002	1	9 26 08.52	2.3362	10 12 05.9	10.102
2	7 31 22.94	2.5372	16 44 48.6	6.117	2	9 28 28.55	2.3316	10 01 58.2	10.154
3	7 33 55.08	2.5339	16 38 38.2	6.231	3	9 30 48.31	2.3270	9 51 47.4	10.205
4	7 36 27.01	2.5305	16 32 20.9	6.344	4	9 33 07.79	2.3224	9 41 33.6	10.254
5	7 38 58.74	2.5270	16 25 56.9	6.455	5	9 35 27.00	2.3179	9 31 16.9	10.302
6	7 41 30.25	2.5234	16 19 26.3	6.566	6	9 37 45.94	2.3133	9 20 57.3	10.349
7	7 44 01.55	2.5198	16 12 49.0	6.676	7	9 40 04.60	2.3087	9 10 35.0	10.393
8	7 46 32.63	2.5162	16 06 05.2	6.783	8	9 42 22.99	2.3042	9 00 10.1	10.437
9	7 49 03.49	2.5124	15 59 15.0	6.891	9	9 44 41.11	2.2997	8 49 42.6	10.479
10	7 51 34.12	2.5087	15 52 18.3	6.997	10	9 46 58.96	2.2952	8 39 12.6	10.520
11	7 54 04.53	2.5048	15 45 15.3	7.102	11	9 49 16.54	2.2908	8 28 40.2	10.560
12	7 56 34.70	2.5009	15 38 06.1	7.205	12	9 51 33.86	2.2864	8 18 05.4	10.598
13	7 59 04.64	2.4970	15 30 50.7	7.307	13	9 53 50.91	2.2820	8 07 28.4	10.634
14	8 01 34.34	2.4929	15 23 29.2	7.408	14	9 56 07.70	2.2776	7 56 49.3	10.669
15	8 04 03.79	2.4888	15 16 01.7	7.508	15	9 58 24.22	2.2732	7 46 08.1	10.704
16	8 06 33.00	2.4848	15 08 28.2	7.607	16	10 00 40.48	2.2688	7 35 24.8	10.737
17	8 09 01.97	2.4807	15 00 48.8	7.705	17	10 02 56.48	2.2645	7 24 39.6	10.768
18	8 11 30.69	2.4766	14 53 03.6	7.801	18	10 05 12.22	2.2602	7 13 52.6	10.798
19	8 13 59.16	2.4723	14 45 12.7	7.895	19	10 07 27.71	2.2560	7 03 03.8	10.827
20	8 16 27.37	2.4680	14 37 16.2	7.988	20	10 09 42.94	2.2517	6 52 13.4	10.854
21	8 18 55.32	2.4637	14 29 14.1	8.081	21	10 11 57.92	2.2475	6 41 21.3	10.882
22	8 21 23.02	2.4595	14 21 06.5	8.172	22	10 14 12.64	2.2433	6 30 27.6	10.907
23	8 23 50.46	2.4552	14 12 53.5	8.262	23	10 16 27.11	2.2392	6 19 32.5	10.929
24	8 26 17.64	+ 2.4507	N.14 04 35.1	− 8.350	24	10 18 41.34	+ 2.2351	N. 6 08 36.1	− 10.952

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 5.					**THURSDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 18 41.34	+ 2.2351	N. 6 08 36.1	− 10.952	0	12 01 56.91	+ 2.0836	S. 2 41 03.8	− 10.722
1	10 20 55.32	2.2310	5 57 38.3	10.973	1	12 04 01.86	2.0814	2 51 46.3	10.693
2	10 23 09.06	2.2269	5 46 39.3	10.992	2	12 06 06.68	2.0793	3 02 27.0	10.664
3	10 25 22.55	2.2228	5 35 39.2	11.012	3	12 08 11.38	2.0773	3 13 06.0	10.635
4	10 27 35.80	2.2189	5 24 37.9	11.029	4	12 10 15.96	2.0753	3 23 43.2	10.605
5	10 29 48.82	2.2150	5 13 35.7	11.045	5	12 12 20.42	2.0734	3 34 18.6	10.574
6	10 32 01.60	2.2111	5 02 32.5	11.061	6	12 14 24.77	2.0715	3 44 52.1	10.542
7	10 34 14.15	2.2072	4 51 28.4	11.074	7	12 16 29.00	2.0697	3 55 23.6	10.508
8	10 36 26.46	2.2033	4 40 23.6	11.087	8	12 18 33.13	2.0679	4 05 53.1	10.475
9	10 38 38.55	2.1996	4 29 18.0	11.098	9	12 20 37.15	2.0662	4 16 20.6	10.442
10	10 40 50.41	2.1958	4 18 11.8	11.108	10	12 22 41.07	2.0645	4 26 46.1	10.407
11	10 43 02.05	2.1921	4 07 05.0	11.118	11	12 24 44.89	2.0627	4 37 09.4	10.370
12	10 45 13.46	2.1883	3 55 57.6	11.127	12	12 26 48.60	2.0611	4 47 30.5	10.334
13	10 47 24.65	2.1847	3 44 49.8	11.132	13	12 28 52.22	2.0596	4 57 49.5	10.297
14	10 49 35.62	2.1811	3 33 41.8	11.137	14	12 30 55.75	2.0580	5 08 06.2	10.259
15	10 51 46.38	2.1775	3 22 33.4	11.142	15	12 32 59.18	2.0565	5 18 20.6	10.221
16	10 53 56.92	2.1740	3 11 24.7	11.146	16	12 35 02.53	2.0551	5 28 32.7	10.182
17	10 56 07.26	2.1705	3 00 15.9	11.148	17	12 37 05.79	2.0537	5 38 42.5	10.143
18	10 58 17.38	2.1670	2 49 07.0	11.149	18	12 39 08.97	2.0523	5 48 49.9	10.102
19	11 00 27.30	2.1637	2 37 58.0	11.149	19	12 41 12.07	2.0510	5 58 54.8	10.061
20	11 02 37.02	2.1602	2 26 49.1	11.147	20	12 43 15.09	2.0497	6 08 57.2	10.019
21	11 04 46.53	2.1569	2 15 40.3	11.146	21	12 45 18.03	2.0483	6 18 57.1	9.977
22	11 06 55.85	2.1537	2 04 31.6	11.142	22	12 47 20.89	2.0472	6 28 54.5	9.934
23	11 09 04.97	+ 2.1503	N. 1 53 23.2	− 11.138	23	12 49 23.69	+ 2.0460	S. 6 38 49.2	− 9.890
	WEDNESDAY 6.					**FRIDAY 8.**			
0	11 11 13.89	+ 2.1472	N. 1 42 15.0	− 11.133	0	12 51 26.41	+ 2.0448	S. 6 48 41.3	− 9.846
1	11 13 22.63	2.1441	1 31 07.2	11.127	1	12 53 29.07	2.0437	6 58 30.7	9.801
2	11 15 31.18	2.1409	1 19 59.8	11.120	2	12 55 31.66	2.0427	7 08 17.4	9.756
3	11 17 39.54	2.1378	1 08 52.8	11.112	3	12 57 34.19	2.0417	7 18 01.4	9.710
4	11 19 47.72	2.1348	0 57 46.4	11.102	4	12 59 36.67	2.0408	7 27 42.6	9.663
5	11 21 55.72	2.1318	0 46 40.5	11.092	5	13 01 39.09	2.0398	7 37 21.0	9.616
6	11 24 03.54	2.1288	0 35 35.3	11.081	6	13 03 41.45	2.0389	7 46 56.5	9.568
7	11 26 11.18	2.1260	0 24 30.8	11.068	7	13 05 43.76	2.0380	7 56 29.2	9.520
8	11 28 18.66	2.1232	0 13 27.1	11.055	8	13 07 46.01	2.0372	8 05 58.9	9.470
9	11 30 25.96	2.1203	N. 0 02 24.2	11.041	9	13 09 48.22	2.0364	8 15 25.6	9.421
10	11 32 33.09	2.1175	S. 0 08 37.8	11.026	10	13 11 50.38	2.0357	8 24 49.4	9.371
11	11 34 40.06	2.1148	0 19 38.9	11.010	11	13 13 52.50	2.0350	8 34 10.1	9.320
12	11 36 46.87	2.1122	0 30 39.0	10.993	12	13 15 54.58	2.0343	8 43 27.8	9.269
13	11 38 53.52	2.1095	0 41 38.1	10.975	13	13 17 56.62	2.0337	8 52 42.4	9.217
14	11 41 00.01	2.1069	0 52 36.0	10.956	14	13 19 58.62	2.0331	9 01 53.9	9.165
15	11 43 06.35	2.1044	1 03 32.8	10.937	15	13 22 00.59	2.0325	9 11 02.2	9.112
16	11 45 12.54	2.1019	1 14 28.4	10.917	16	13 24 02.52	2.0319	9 20 07.4	9.059
17	11 47 18.58	2.0994	1 25 22.8	10.895	17	13 26 04.42	2.0315	9 29 09.3	9.005
18	11 49 24.47	2.0970	1 36 15.8	10.872	18	13 28 06.30	2.0311	9 38 08.0	8.951
19	11 51 30.22	2.0946	1 47 07.5	10.850	19	13 30 08.15	2.0306	9 47 03.4	8.896
20	11 53 35.82	2.0923	1 57 57.8	10.826	20	13 32 09.97	2.0302	9 55 55.5	8.841
21	11 55 41.29	2.0901	2 08 46.6	10.801	21	13 34 11.77	2.0298	10 04 44.3	8.785
22	11 57 46.63	2.0878	2 19 33.9	10.775	22	13 36 13.55	2.0295	10 13 29.7	8.728
23	11 59 51.83	2.0857	2 30 19.6	10.749	23	13 38 15.31	2.0292	10 22 11.7	8.672
24	12 01 56.91	+ 2.0836	S. 2 41 03.8	− 10.722	24	13 40 17.05	+ 2.0289	S. 10 30 50.3	− 8.614

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 9.					MONDAY 11.			
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 40 17.05	+2.0289	S.10 30 50.3	−8.614	0	15 17 52.09	+2.0451	S.16 10 06.8	−5.374
1	13 42 18.78	2.0287	10 39 25.4	8.557	1	15 19 54.82	2.0458	16 15 27.0	5.298
2	13 44 20.49	2.0285	10 47 57.1	8.499	2	15 21 57.59	2.0466	16 20 42.6	5.222
3	13 46 22.20	2.0283	10 56 25.3	8.440	3	15 24 00.41	2.0474	16 25 53.6	5.144
4	13 48 23.89	2.0282	11 04 49.9	8.380	4	15 26 03.28	2.0482	16 30 59.9	5.067
5	13 50 25.58	2.0281	11 13 10.9	8.321	5	15 28 06.20	2.0490	16 36 01.6	4.990
6	13 52 27.26	2.0280	11 21 28.4	8.261	6	15 30 09.16	2.0497	16 40 58.7	4.912
7	13 54 28.94	2.0279	11 29 42.2	8.200	7	15 32 12.16	2.0504	16 45 51.1	4.834
8	13 56 30.61	2.0278	11 37 52.4	8.139	8	15 34 15.21	2.0513	16 50 38.8	4.756
9	13 58 32.28	2.0279	11 45 58.9	8.077	9	15 36 18.32	2.0522	16 55 21.8	4.677
10	14 00 33.96	2.0279	11 54 01.7	8.016	10	15 38 21.47	2.0529	17 00 00.1	4.598
11	14 02 35.63	2.0279	12 02 00.8	7.952	11	15 40 24.67	2.0537	17 04 33.6	4.519
12	14 04 37.31	2.0281	12 09 56.0	7.889	12	15 42 27.92	2.0546	17 09 02.4	4.440
13	14 06 39.00	2.0282	12 17 47.5	7.827	13	15 44 31.22	2.0554	17 13 26.4	4.360
14	14 08 40.69	2.0282	12 25 35.3	7.764	14	15 46 34.57	2.0562	17 17 45.6	4.280
15	14 10 42.39	2.0284	12 33 19.2	7.699	15	15 48 37.97	2.0571	17 22 00.0	4.200
16	14 12 44.10	2.0287	12 40 59.2	7.635	16	15 50 41.42	2.0578	17 26 09.6	4.119
17	14 14 45.83	2.0289	12 48 35.4	7.571	17	15 52 44.91	2.0587	17 30 14.3	4.038
18	14 16 47.57	2.0291	12 56 07.7	7.505	18	15 54 48.46	2.0596	17 34 14.2	3.957
19	14 18 49.32	2.0293	13 03 36.0	7.439	19	15 56 52.06	2.0604	17 38 09.2	3.877
20	14 20 51.09	2.0296	13 11 00.4	7.373	20	15 58 55.71	2.0612	17 41 59.4	3.795
21	14 22 52.87	2.0299	13 18 20.8	7.307	21	16 00 59.40	2.0620	17 45 44.6	3.713
22	14 24 54.68	2.0303	13 25 37.2	7.239	22	16 03 03.15	2.0629	17 49 25.0	3.632
23	14 26 56.51	+2.0307	S.13 32 49.5	−7.172	23	16 05 06.95	+2.0637	S.17 53 00.4	−3.549
	SUNDAY 10.					TUESDAY 12.			
0	14 28 58.36	+2.0310	S.13 39 57.8	−7.105	0	16 07 10.79	+2.0645	S.17 56 30.9	−3.467
1	14 31 00.23	2.0313	13 47 02.1	7.037	1	16 09 14.69	2.0653	17 59 56.4	3.384
2	14 33 02.12	2.0317	13 54 02.3	6.968	2	16 11 18.63	2.0661	18 03 17.0	3.302
3	14 35 04.04	2.0322	14 00 58.3	6.899	3	16 13 22.62	2.0669	18 06 32.6	3.218
4	14 37 05.99	2.0327	14 07 50.2	6.831	4	16 15 26.66	2.0677	18 09 43.2	3.135
5	14 39 07.97	2.0332	14 14 38.0	6.762	5	16 17 30.75	2.0686	18 12 48.8	3.052
6	14 41 09.97	2.0336	14 21 21.6	6.692	6	16 19 34.89	2.0694	18 15 49.4	2.968
7	14 43 12.00	2.0342	14 28 01.0	6.621	7	16 21 39.08	2.0702	18 18 45.0	2.884
8	14 45 14.07	2.0347	14 34 36.1	6.550	8	16 23 43.31	2.0709	18 21 35.5	2.800
9	14 47 16.17	2.0352	14 41 07.0	6.479	9	16 25 47.59	2.0717	18 24 21.0	2.716
10	14 49 18.30	2.0357	14 47 33.6	6.408	10	16 27 51.92	2.0726	18 27 01.4	2.631
11	14 51 20.46	2.0363	14 53 56.0	6.337	11	16 29 56.30	2.0733	18 29 36.7	2.546
12	14 53 22.66	2.0370	15 00 14.0	6.264	12	16 32 00.72	2.0741	18 32 06.9	2.461
13	14 55 24.90	2.0376	15 06 27.7	6.192	13	16 34 05.19	2.0748	18 34 32.0	2.376
14	14 57 27.17	2.0382	15 12 37.1	6.119	14	16 36 09.70	2.0756	18 36 52.0	2.291
15	14 59 29.48	2.0387	15 18 42.0	6.046	15	16 38 14.26	2.0763	18 39 06.9	2.206
16	15 01 31.82	2.0394	15 24 42.6	5.973	16	16 40 18.86	2.0770	18 41 16.7	2.120
17	15 03 34.21	2.0402	15 30 38.8	5.899	17	16 42 23.50	2.0777	18 43 21.3	2.034
18	15 05 36.64	2.0408	15 36 30.5	5.825	18	16 44 28.19	2.0785	18 45 20.8	1.948
19	15 07 39.11	2.0415	15 42 17.8	5.751	19	16 46 32.92	2.0792	18 47 15.1	1.862
20	15 09 41.62	2.0422	15 48 00.6	5.677	20	16 48 37.69	2.0798	18 49 04.3	1.777
21	15 11 44.17	2.0429	15 53 39.0	5.602	21	16 50 42.50	2.0806	18 50 48.3	1.689
22	15 13 46.77	2.0437	15 59 12.8	5.526	22	16 52 47.36	2.0812	18 52 27.0	1.602
23	15 15 49.41	2.0443	16 04 42.1	5.450	23	16 54 52.25	2.0818	18 54 00.6	1.517
24	15 17 52.09	+2.0451	S.16 10 06.8	−5.374	24	16 56 57.18	+2.0825	S.18 55 29.0	−1.430

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ' "	"
0	16 56 57.18	+ 2.0825	S.18 55 29.0	− 1.430
1	16 59 02.15	2.0832	18 56 52.2	1.342
2	17 01 07.16	2.0837	18 58 10.1	1.255
3	17 03 12.20	2.0843	18 59 22.8	1.167
4	17 05 17.28	2.0850	19 00 30.2	1.080
5	17 07 22.40	2.0856	19 01 32.4	0.993
6	17 09 27.55	2.0861	19 02 29.4	0.905
7	17 11 32.73	2.0867	19 03 21.1	0.818
8	17 13 37.95	2.0872	19 04 07.6	0.731
9	17 15 43.20	2.0877	19 04 48.8	0.642
10	17 17 48.48	2.0882	19 05 24.7	0.555
11	17 19 53.79	2.0887	19 05 55.4	0.467
12	17 21 59.13	2.0892	19 06 20.8	0.379
13	17 24 04.50	2.0897	19 06 40.9	0.291
14	17 26 09.90	2.0902	19 06 55.7	0.202
15	17 28 15.32	2.0906	19 07 05.2	0.115
16	17 30 20.77	2.0910	19 07 09.5	− 0.027
17	17 32 26.24	2.0914	19 07 08.4	+ 0.062
18	17 34 31.74	2.0918	19 07 02.0	0.151
19	17 36 37.26	2.0922	19 06 50.3	0.239
20	17 38 42.80	2.0925	19 06 33.3	0.327
21	17 40 48.36	2.0928	19 06 11.0	0.416
22	17 42 53.94	2.0932	19 05 43.4	0.504
23	17 44 59.54	+ 2.0934	S.19 05 10.5	+ 0.593

THURSDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 47 05.15	+ 2.0937	S.19 04 32.2	+ 0.682
1	17 49 10.78	2.0940	19 03 48.7	0.770
2	17 51 16.43	2.0943	19 02 59.8	0.859
3	17 53 22.10	2.0945	19 02 05.6	0.947
4	17 55 27.77	2.0947	19 01 06.1	1.036
5	17 57 33.46	2.0949	19 00 01.3	1.124
6	17 59 39.16	2.0951	18 58 51.2	1.212
7	18 01 44.87	2.0952	18 57 35.8	1.301
8	18 03 50.59	2.0954	18 56 15.1	1.390
9	18 05 56.32	2.0956	18 54 49.0	1.478
10	18 08 02.06	2.0957	18 53 17.7	1.566
11	18 10 07.80	2.0957	18 51 41.1	1.655
12	18 12 13.54	2.0957	18 49 59.1	1.743
13	18 14 19.29	2.0958	18 48 11.9	1.831
14	18 16 25.04	2.0959	18 46 19.4	1.919
15	18 18 30.80	2.0959	18 44 21.6	2.007
16	18 20 36.55	2.0959	18 42 18.5	2.095
17	18 22 42.31	2.0959	18 40 10.2	2.182
18	18 24 48.06	2.0958	18 37 56.6	2.271
19	18 26 53.81	2.0958	18 35 37.7	2.359
20	18 28 59.56	2.0957	18 33 13.5	2.447
21	18 31 05.30	2.0957	18 30 44.1	2.533
22	18 33 11.04	2.0956	18 28 09.5	2.621
23	18 35 16.77	2.0954	18 25 29.6	2.708
24	18 37 22.49	+ 2.0953	S.18 22 44.5	+ 2.795

FRIDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ' "	"
0	18 37 22.49	+ 2.0953	S.18 22 44.5	+ 2.795
1	18 39 28.21	2.0952	18 19 54.2	2.882
2	18 41 33.91	2.0949	18 16 58.6	2.969
3	18 43 39.60	2.0948	18 13 57.9	3.055
4	18 45 45.29	2.0947	18 10 52.0	3.142
5	18 47 50.96	2.0944	18 07 40.9	3.228
6	18 49 56.62	2.0942	18 04 24.6	3.315
7	18 52 02.26	2.0939	18 01 03.1	3.401
8	18 54 07.89	2.0937	17 57 36.5	3.487
9	18 56 13.50	2.0933	17 54 04.7	3.572
10	18 58 19.09	2.0930	17 50 27.8	3.657
11	19 00 24.66	2.0927	17 46 45.8	3.742
12	19 02 30.22	2.0925	17 42 58.8	3.827
13	19 04 35.76	2.0922	17 39 06.6	3.912
14	19 06 41.28	2.0917	17 35 09.4	3.996
15	19 08 46.77	2.0913	17 31 07.1	4.081
16	19 10 52.24	2.0910	17 26 59.7	4.165
17	19 12 57.69	2.0907	17 22 47.3	4.248
18	19 15 03.12	2.0902	17 18 29.9	4.332
19	19 17 08.52	2.0897	17 14 07.4	4.416
20	19 19 13.89	2.0893	17 09 40.0	4.498
21	19 21 19.24	2.0889	17 05 07.6	4.582
22	19 23 24.56	2.0885	17 00 30.2	4.664
23	19 25 29.86	+ 2.0881	S.16 55 47.9	+ 4.746

SATURDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 27 35.13	+ 2.0876	S.16 51 00.7	+ 4.828
1	19 29 40.37	2.0871	16 46 08.5	4.910
2	19 31 45.58	2.0866	16 41 11.5	4.991
3	19 33 50.76	2.0861	16 36 09.6	5.072
4	19 35 55.91	2.0856	16 31 02.9	5.152
5	19 38 01.03	2.0850	16 25 51.3	5.233
6	19 40 06.11	2.0845	16 20 34.9	5.313
7	19 42 11.17	2.0840	16 15 13.7	5.392
8	19 44 16.19	2.0834	16 09 47.8	5.472
9	19 46 21.18	2.0829	16 04 17.1	5.552
10	19 48 26.14	2.0823	15 58 41.6	5.630
11	19 50 31.06	2.0817	15 53 01.5	5.708
12	19 52 35.95	2.0812	15 47 16.6	5.787
13	19 54 40.80	2.0806	15 41 27.1	5.864
14	19 56 45.62	2.0801	15 35 32.9	5.942
15	19 58 50.41	2.0795	15 29 34.1	6.018
16	20 00 55.16	2.0788	15 23 30.7	6.094
17	20 02 59.87	2.0782	15 17 22.8	6.170
18	20 05 04.55	2.0777	15 11 10.3	6.246
19	20 07 09.19	2.0771	15 04 53.3	6.321
20	20 09 13.80	2.0765	14 58 31.8	6.396
21	20 11 18.37	2.0758	14 52 05.8	6.470
22	20 13 22.90	2.0752	14 45 35.4	6.544
23	20 15 27.40	2.0747	14 39 00.5	6.617
24	20 17 31.86	+ 2.0740	S.14 32 21.3	+ 6.690

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 17					TUESDAY 19				

SUNDAY 17. (left) **TUESDAY 19.** (right)

Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ' ")	Diff. for 1 Minute. (")	Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ' ")	Diff. for 1 Minute. (")
0	20 17 31.86	+ 2.0740	S.14 32 21.3	+ 6.690	0	21 56 29.37	+ 2.0537	S. 7 56 55.0	+ 9.560
1	20 19 36.28	2.0734	14 25 37.7	6.763	1	21 58 32.59	2.0537	7 47 20.1	9.604
2	20 21 40.67	2.0728	14 18 49.7	6.836	2	22 00 35.82	2.0537	7 37 42.5	9.647
3	20·23 45.02	2.0722	14 11 57.4	6.907	3	22 02 39.04	2.0537	7 28 02.4	9.690
4	20 25 49.33	2.0716	14 05 00.9	6.978	4	22 04 42.26	2.0537	7 18 19.7	9.732
5	20 27 53.61	2.0710	13 58 00.0	7.050	5	22 06 45.49	2.0538	7 08 34.5	9.773
6	20 29 57.85	2.0704	13 50 54.9	7.119	6	22 08 48.72	2.0539	6 58 46.9	9.813
7	20 32 02.06	2.0698	13 43 45.7	7.188	7	22 10 51.96	2.0540	6 48 56.9	9.853
8	20 34 06.23	2.0692	13 36 32.3	7.258	8	22 12 55.20	2.0541	6 39 04.5	9.893
9	20 36 10.36	2.0686	13 29 14.7	7.327	9	22 14 58.45	2.0542	6 29 09.7	9.932
10	20 38 14.46	2.0680	13 21 53.1	7.395	10	22 17 01.71	2.0545	6 19 12.7	9.968
11	20 40 18.52	2.0674	13 14 27.3	7.463	11	22 19 04.99	2.0547	6 09 13.5	10.005
12	20 42 22.55	2.0668	13 06 57.5	7.530	12	22 21 08.28	2.0550	5 59 12.1	10.042
13	20 44 26.54	2.0662	12 59 23.7	7.597	13	22 23 11.59	2.0552	5 49 08.5	10.077
14	20 46 30.50	2.0657	12 51 45.9	7.663	14	22 25 14.91	2.0555	5 39 02.8	10.112
15	20 48 34.43	2.0652	12 44 04.1	7.729	15	22 27 18.25	2.0558	5 28 55.1	10.145
16	20 50 38.32	2.0646	12 36 18.4	7.794	16	22 29 21.61	2.0562	5 18 45.4	10.178
17	20 52 42.18	2.0641	12 28 28.8	7.858	17	22 31 25.00	2.0567	5 08 33.7	10.211
18	20 54 46.01	2.0635	12 20 35.4	7.922	18	22 33 28.41	2.0570	4 58 20.1	10.242
19	20 56 49.80	2.0630	12 12 38.1	7.987	19	22 35 31.84	2.0574	4 48 04.7	10.272
20	20 58 53.57	2.0625	12 04 37.0	8.049	20	22 37 35.30	2.0580	4 37 47.5	10.302
21	21 00 57.30	2.0619	11 56 32.2	8.111	21	22 39 38.80	2.0585	4 27 28.5	10.331
22	21 03 01.00	2.0614	11 48 23.7	8.172	22	22 41 42.32	2.0589	4 17 07.8	10.359
23	21 05 04.67	+ 2.0610	S.11 40 11.5	+ 8.234	23	22 43 45.87	+ 2.0595	S. 4 06 45.4	+ 10.386

MONDAY 18. (left) **WEDNESDAY 20.** (right)

Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ' ")	Diff. for 1 Minute. (")	Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ' ")	Diff. for 1 Minute. (")
0	21 07 08.32	+ 2.0606	S.11 31 55.6	+ 8.295	0	22 45 49.46	+ 2.0602	S. 3 56 21.5	+ 10.413
1	21 09 11.94	2.0601	11 23 36.1	8.355	1	22 47 53.09	2.0608	3 45 55.9	10.439
2	21 11 15.53	2.0596	11 15 13.0	8.414	2	22 49 56.76	2.0615	3 35 28.8	10.463
3	21 13 19.09	2.0592	11 06 46.4	8.473	3	22 52 00.47	2.0622	3 25 00.3	10.487
4	21 15 22.63	2.0587	10 58 16.2	8.532	4	22 54 04.22	2.0629	3 14 30.3	10.511
5	21 17 26.14	2.0583	10 49 42.6	8.589	5	22 56 08.02	2.0637	3 03 59.0	10.533
6	21 19 29.63	2.0579	10 41 05.5	8.646	6	22 58 11.86	2.0644	2 53 26.3	10.555
7	21 21 33.09	2.0575	10 32 25.1	8.702	7	23 00 15.75	2.0652	2 42 52.4	10.575
8	21 23 36.53	2.0572	10 23 41.3	8.757	8	23 02 19.69	2.0662	2 32 17.3	10.595
9	21 25 39.95	2.0568	10 14 54.2	8.812	9	23 04 23.69	2.0671	2 21 41.0	10.614
10	21 27 43.35	2.0565	10 06 03.8	8.867	10	23 06 27.74	2.0680	2 11 03.6	10.632
11	21 29 46.73	2.0562	9 57 10.1	8.922	11	23 08 31.85	2.0690	2 00 25.1	10.649
12	21 31 50.09	2.0558	9 48 13.2	8.974	12	23 10 36.02	2.0700	1 49 45.7	10.665
13	21 33 53.43	2.0556	9 39 13.2	9.027	13	23 12 40.25	2.0710	1 39 05.3	10.682
14	21 35 56.76	2.0553	9 30 10.0	9.079	14	23 14 44.54	2.0721	1 28 23.9	10.697
15	21 38 00.07	2.0551	9 21 03.7	9.130	15	23 16 48.90	2.0732	1 17 41.7	10.710
16	21 40 03.37	2.0548	9 11 54.4	9.180	16	23 18 53.33	2.0743	1 06 58.7	10.722
17	21 42 06.65	2.0547	9 02 42.1	9.230	17	23 20 57.82	2.0755	0 56 15.0	10.734
18	21 44 09.93	2.0545	8 53 26.8	9.279	18	23 23 02.39	2.0767	0 45 30.6	10.746
19	21 46 13.19	2.0542	8 44 08.6	9.327	19	23 25 07.03	2.0780	0 34 45.5	10.757
20	21 48 16.44	2.0541	8 34 47.5	9.376	20	23 27 11.75	2.0793	0 23 59.8	10.766
21	21 50 19.68	2.0540	8 25 23.5	9.422	21	23 29 16.55	2.0807	0 13 13.6	10.773
22	21 52 22.92	2.0539	8 15 56.8	9.468	22	23 31 21.43	2.0820	S. 0 02 27.0	10.781
23	21 54 26.15	2.0537	8 06 27.3	9.515	23	23 33 26.39	2.0834	N. 0 08 20.1	10.788
24	21 56 29.37	+ 2.0537	S. 7 56 55.0	+ 9.560	24	23 35 31.44	+ 2.0849	N. 0 19 07.6	+ 10.794

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
				THURSDAY 21.					
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 35 31.44	+ 2.0849	N. 0 19 07.6	+10.794	0	1 17 58.13	+ 2.1977	N. 8 45 38.2	+ 9.930
1	23 37 36.58	2.0863	0 29 55.4	10.798	1	1 20 10.09	2.2009	8 55 32.7	9.887
2	23 39 41.80	2.0878	0 40 43.4	10.802	2	1 22 22.24	2.2041	9 05 24.6	9.843
3	23 41 47.12	2.0894	0 51 31.6	10.805	3	1 24 34.58	2.2073	9 15 13.9	9.798
4	23 43 52.53	2.0909	1 02 20.0	10.807	4	1 26 47.12	2.2106	9 25 00.4	9.752
5	23 45 58.03	2.0926	1 13 08.5	10.808	5	1 28 59.85	2.2139	9 34 44.1	9.705
6	23 48 03.64	2.0943	1 23 57.0	10.808	6	1 31 12.79	2.2173	9 44 25.0	9.657
7	23 50 09.35	2.0960	1 34 45.5	10.807	7	1 33 25.93	2.2207	9 54 03.0	9.608
8	23 52 15.16	2.0977	1 45 33.9	10.806	8	1 35 39.27	2.2240	10 03 38.0	9.558
9	23 54 21.07	2.0995	1 56 22.2	10.803	9	1 37 52.81	2.2274	10 13 10.0	9.507
10	23 56 27.10	2.1013	2 07 10.3	10.799	10	1 40 06.56	2.2309	10 22 38.9	9.455
11	23 58 33.23	2.1032	2 17 58.1	10.795	11	1 42 20.52	2.2344	10 32 04.6	9.402
12	0 00 39.48	2.1051	2 28 45.7	10.790	12	1 44 34.69	2.2379	10 41 27.1	9.347
13	0 02 45.84	2.1070	2 39 32.9	10.782	13	1 46 49.07	2.2414	10 50 46.3	9.292
14	0 04 52.32	2.1089	2 50 19.6	10.775	14	1 49 03.66	2.2449	11 00 02.1	9.235
15	0 06 58.91	2.1109	3 01 05.9	10.767	15	1 51 18.46	2.2484	11 09 14.5	9.177
16	0 09 05.63	2.1130	3 11 51.6	10.757	16	1 53 33.47	2.2520	11 18 23.4	9.118
17	0 11 12.47	2.1151	3 22 36.8	10.747	17	1 55 48.70	2.2556	11 27 28.7	9.058
18	0 13 19.44	2.1172	3 33 21.3	10.736	18	1 58 04.14	2.2592	11 36 30.4	8.998
19	0 15 26.54	2.1194	3 44 05.1	10.724	19	2 00 19.80	2.2628	11 45 28.5	8.937
20	0 17 33.77	2.1216	3 54 48.2	10.711	20	2 02 35.68	2.2665	11 54 22.8	8.873
21	0 19 41.13	2.1238	4 05 30.4	10.696	21	2 04 51.78	2.2702	12 03 13.3	8.809
22	0 21 48.63	2.1261	4 16 11.7	10.681	22	2 07 08.10	2.2738	12 11 59.9	8.744
23	0 23 56.26	+ 2.1283	N. 4 26 52.1	+10.664	23	2 09 24.64	+ 2.2775	N.12 20 42.6	+ 8.677
				FRIDAY 22.					**SUNDAY 24.**
0	0 26 04.03	+ 2.1307	N. 4 37 31.4	+10.647	0	2 11 41.40	+ 2.2812	N.12 29 21.2	+ 8.610
1	0 28 11.95	2.1332	4 48 09.7	10.629	1	2 13 58.38	2.2849	12 37 55.8	8.542
2	0 30 20.01	2.1356	4 58 46.9	10.610	2	2 16 15.59	2.2887	12 46 26.3	8.473
3	0 32 28.22	2.1380	5 09 22.9	10.590	3	2 18 33.02	2.2923	12 54 52.6	8.403
4	0 34 36.57	2.1405	5 19 57.7	10.568	4	2 20 50.67	2.2961	13 03 14.7	8.332
5	0 36 45.08	2.1431	5 30 31.1	10.546	5	2 23 08.55	2.2998	13 11 32.5	8.260
6	0 38 53.74	2.1456	5 41 03.2	10.523	6	2 25 26.65	2.3036	13 19 45.9	8.186
7	0 41 02.55	2.1482	5 51 33.9	10.499	7	2 27 44.98	2.3074	13 27 54.8	8.111
8	0 43 11.52	2.1508	6 02 03.1	10.474	8	2 30 03.54	2.3112	13 35 59.2	8.036
9	0 45 20.65	2.1535	6 12 30.8	10.447	9	2 32 22.32	2.3149	13 43 59.1	7.960
10	0 47 29.94	2.1562	6 22 56.8	10.420	10	2 34 41.33	2.3187	13 51 54.4	7.882
11	0 49 39.40	2.1590	6 33 21.2	10.392	11	2 37 00.57	2.3225	13 59 45.0	7.804
12	0 51 49.02	2.1617	6 43 43.8	10.362	12	2 39 20.03	2.3262	14 07 30.9	7.724
13	0 53 58.81	2.1646	6 54 04.6	10.332	13	2 41 39.72	2.3301	14 15 11.9	7.643
14	0 56 08.77	2.1674	7 04 23.6	10.301	14	2 43 59.64	2.3339	14 22 48.1	7.562
15	0 58 18.90	2.1702	7 14 40.7	10.268	15	2 46 19.79	2.3377	14 30 19.3	7.479
16	1 00 29.20	2.1732	7 24 55.8	10.235	16	2 48 40.16	2.3414	14 37 45.6	7.396
17	1 02 39.68	2.1762	7 35 08.9	10.201	17	2 51 00.76	2.3452	14 45 06.8	7.311
18	1 04 50.34	2.1792	7 45 19.9	10.165	18	2 53 21.58	2.3489	14 52 22.9	7.225
19	1 07 01.18	2.1822	7 55 28.7	10.128	19	2 55 42.63	2.3527	14 59 33.8	7.138
20	1 09 12.20	2.1852	8 05 35.3	10.091	20	2 58 03.90	2.3564	15 06 39.5	7.051
21	1 11 23.40	2.1882	8 15 39.6	10.052	21	3 00 25.40	2.3602	15 13 39.9	6.962
22	1 13 34.79	2.1914	8 25 41.6	10.012	22	3 02 47.12	2.3639	15 20 35.0	6.872
23	1 15 46.37	2.1945	8 35 41.1	9.972	23	3 05 09.07	2.3677	15 27 24.6	6.782
24	1 17 58.13	+ 2.1977	N. 8 45 38.2	+ 9.930	24	3 07 31.24	+ 2.3713	N.15 34 08.8	+ 6.691

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 25.					**WEDNESDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 07 31.24	+ 2.3713	N.15 34 08.8	+ 6.691	0	5 05 02.13	+ 2.5075	N.18 53 30.8	+ 1.344
1	3 09 53.63	2.3750	15 40 47.5	6.598	1	5 07 32.63	2.5090	18 54 47.7	1.219
2	3 12 16.24	2.3787	15 47 20.6	6.504	2	5 10 03.21	2.5103	18 55 57.1	1.093
3	3 14 39.07	2.3823	15 53 48.0	6.409	3	5 12 33.87	2.5117	18 56 58.9	0.967
4	3 17 02.12	2.3860	16 00 09.7	6.314	4	5 15 04.61	2.5130	18 57 53.1	0.840
5	3 19 25.39	2.3896	16 06 25.7	6.218	5	5 17 35.43	2.5142	18 58 39.7	0.713
6	3 21 48.87	2.3932	16 12 35.9	6.121	6	5 20 06.32	2.5153	18 59 18.7	0.587
7	3 24 12.57	2.3967	16 18 40.2	6.022	7	5 22 37.27	2.5163	18 59 50.1	0.459
8	3 26 36.48	2.4002	16 24 38.6	5.923	8	5 25 08.28	2.5172	19 00 13.8	0.332
9	3 29 00.60	2.4037	16 30 31.0	5.823	9	5 27 39.34	2.5181	19 00 29.9	0.204
10	3 31 24.93	2.4072	16 36 17.4	5.722	10	5 30 10.45	2.5189	19 00 38.3	+ 0.077
11	3 33 49.47	2.4107	16 41 57.7	5.621	11	5 32 41.61	2.5197	19 00 39.1	− 0.052
12	3 36 14.22	2.4142	16 47 31.9	5.518	12	5 35 12.81	2.5203	19 00 32.1	0.180
13	3 38 39.18	2.4176	16 52 59.9	5.414	13	5 37 44.05	2.5209	19 00 17.5	0.307
14	3 41 04.33	2.4209	16 58 21.6	5.310	14	5 40 15.32	2.5214	18 59 55.2	0.436
15	3 43 29.69	2.4243	17 03 37.1	5.205	15	5 42 46.62	2.5218	18 59 25.2	0.563
16	3 45 55.25	2.4277	17 08 46.2	5.099	16	5 45 17.94	2.5222	18 58 47.6	0.692
17	3 48 21.01	2.4309	17 13 49.0	4.992	17	5 47 49.28	2.5224	18 58 02.2	0.820
18	3 50 46.96	2.4341	17 18 45.3	4.884	18	5 50 20.63	2.5226	18 57 09.2	0.947
19	3 53 13.10	2.4372	17 23 35.1	4.776	19	5 52 51.99	2.5227	18 56 08.5	1.076
20	3 55 39.43	2.4404	17 28 18.4	4.667	20	5 55 23.36	2.5227	18 55 00.1	1.203
21	3 58 05.95	2.4436	17 32 55.1	4.557	21	5 57 54.72	2.5227	18 53 44.1	1.331
22	4 00 32.66	2.4467	17 37 25.2	4.446	22	6 00 26.08	2.5226	18 52 20.4	1.459
23	4 02 59.55	+ 2.4497	N.17 41 48.6	+ 4.334	23	6 02 57.43	+ 2.5223	N.18 50 49.0	− 1.587
	TUESDAY 26.					**THURSDAY 28.**			
0	4 05 26.62	+ 2.4527	N.17 46 05.3	+ 4.222	0	6 05 28.76	+ 2.5220	N.18 49 10.0	− 1.713
1	4 07 53.87	2.4556	17 50 15.2	4.109	1	6 08 00.07	2.5217	18 47 23.4	1.841
2	4 10 21.29	2.4585	17 54 18.4	3.996	2	6 10 31.36	2.5212	18 45 29.1	1.968
3	4 12 48.89	2.4613	17 58 14.7	3.881	3	6 13 02.62	2.5207	18 43 27.2	2.095
4	4 15 16.65	2.4641	18 02 04.1	3.766	4	6 15 33.85	2.5202	18 41 17.7	2.222
5	4 17 44.58	2.4668	18 05 46.6	3.650	5	6 18 05.04	2.5194	18 39 00.6	2.347
6	4 20 12.67	2.4695	18 09 22.1	3.533	6	6 20 36.18	2.5187	18 36 36.0	2.473
7	4 22 40.92	2.4722	18 12 50.6	3.417	7	6 23 07.28	2.5178	18 34 03.8	2.599
8	4 25 09.33	2.4747	18 16 12.1	3.299	8	6 25 38.32	2.5169	18 31 24.1	2.724
9	4 27 37.89	2.4772	18 19 26.5	3.181	9	6 28 09.31	2.5160	18 28 36.9	2.849
10	4 30 06.60	2.4797	18 22 33.8	3.062	10	6 30 40.24	2.5149	18 25 42.2	2.974
11	4 32 35.45	2.4821	18 25 33.9	2.942	11	6 33 11.10	2.5138	18 22 40.0	3.099
12	4 35 04.45	2.4845	18 28 26.9	2.822	12	6 35 41.90	2.5127	18 19 30.3	3.222
13	4 37 33.59	2.4867	18 31 12.6	2.702	13	6 38 12.62	2.5113	18 16 13.3	3.345
14	4 40 02.86	2.4889	18 33 51.1	2.581	14	6 40 43.26	2.5099	18 12 48.9	3.468
15	4 42 32.26	2.4911	18 36 22.3	2.459	15	6 43 13.81	2.5085	18 09 17.1	3.591
16	4 45 01.79	2.4932	18 38 46.2	2.337	16	6 45 44.28	2.5071	18 05 38.0	3.712
17	4 47 31.44	2.4952	18 41 02.7	2.214	17	6 48 14.66	2.5055	18 01 51.6	3.833
18	4 50 01.21	2.4972	18 43 11.9	2.092	18	6 50 44.94	2.5039	17 57 58.0	3.954
19	4 52 31.10	2.4991	18 45 13.7	1.968	19	6 53 15.13	2.5022	17 53 57.1	4.075
20	4 55 01.10	2.5009	18 47 08.1	1.844	20	6 55 45.21	2.5004	17 49 49.0	4.194
21	4 57 31.21	2.5027	18 48 55.0	1.719	21	6 58 15.18	2.4986	17 45 33.8	4.313
22	5 00 01.42	2.5043	18 50 34.4	1.595	22	7 00 45.04	2.4967	17 41 11.4	4.432
23	5 02 31.73	2.5059	18 52 06.4	1.470	23	7 03 14.79	2.4947	17 36 41.9	4.550
24	5 05 02.13	+ 2.5075	N.18 53 30.8	+ 1.344	24	7 05 44.41	+ 2.4927	N.17 32 05.4	− 4.667

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 29.					**SUNDAY 31.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 05 44.41	+ 2.4927	N.17 32 05.4	− 4.667	0	9 02 07.87	+ 2.3442	N.11 49 42.1	− 9.203
1	7 08 13.91	2.4907	17 27 21.9	4.783	1	9 04 28.41	2.3404	11 40 27.9	9.270
2	7 10 43.29	2.4885	17 22 31.4	4.899	2	9 06 48.72	2.3367	11 31 09.7	9.336
3	7 13 12.53	2.4862	17 17 34.0	5.014	3	9 09 08.82	2.3332	11 21 47.6	9.401
4	7 15 41.64	2.4840	17 12 29.7	5.128	4	9 11 28.70	2.3295	11 12 21.6	9.464
5	7 18 10.61	2.4817	17 07 18.6	5.242	5	9 13 48.36	2.3258	11 02 51.9	9.527
6	7 20 39.44	2.4792	17 02 00.7	5.355	6	9 16 07.80	2.3222	10 53 18.4	9.588
7	7 23 08.12	2.4768	16 56 36.0	5.467	7	9 18 27.02	2.3185	10 43 41.4	9.647
8	7 25 36.66	2.4744	16 51 04.7	5.577	8	9 20 46.02	2.3148	10 34 00.8	9.706
9	7 28 05.05	2.4718	16 45 26.7	5.688	9	9 23 04.80	2.3112	10 24 16.7	9.762
10	7 30 33.28	2.4692	16 39 42.1	5.797	10	9 25 23.37	2.3076	10 14 29.3	9.818
11	7 33 01.36	2.4666	16 33 51.0	5.905	11	9 27 41.71	2.3039	10 04 38.5	9.873
12	7 35 29.27	2.4638	16 27 53.5	6.012	12	9 29 59.84	2.3003	9 54 44.5	9.927
13	7 37 57.02	2.4612	16 21 49.5	6.120	13	9 32 17.75	2.2967	9 44 47.3	9.978
14	7 40 24.61	2.4583	16 15 39.1	6.227	14	9 34 35.45	2.2932	9 34 47.1	10.029
15	7 42 52.02	2.4555	16 09 22.3	6.332	15	9 36 52.93	2.2895	9 24 43.8	10.079
16	7 45 19.27	2.4527	16 02 59.3	6.435	16	9 39 10.19	2.2859	9 14 37.6	10.127
17	7 47 46.34	2.4497	15 56 30.1	6.538	17	9 41 27.24	2.2824	9 04 28.5	10.175
18	7 50 13.23	2.4467	15 49 54.7	6.641	18	9 43 44.08	2.2788	8 54 16.6	10.221
19	7 52 39.94	2.4437	15 43 13.2	6.742	19	9 46 00.70	2.2753	8 44 02.0	10.265
20	7 55 06.47	2.4406	15 36 25.7	6.842	20	9 48 17.12	2.2718	8 33 44.8	10.308
21	7 57 32.81	2.4375	15 29 32.2	6.942	21	9 50 33.32	2.2682	8 23 25.0	10.351
22	7 59 58.97	2.4344	15 22 32.7	7.040	22	9 52 49.30	2.2647	8 13 02.7	10.392
23	8 02 24.94	+ 2.4312	N.15 15 27.4	− 7.137	23	9 55 05.08	+ 2.2612	N. 8 02 38.0	− 10.432
	SATURDAY 30.					**MONDAY, SEPTEMBER 1.**			
0	8 04 50.71	+ 2.4280	N.15 08 16.3	− 7.233	0	9 57 20.65	+ 2.2578	N. 7 52 10.9	− 10.470
1	8 07 16.30	2.4248	15 00 59.4	7.328					
2	8 09 41.69	2.4215	14 53 36.9	7.422					
3	8 12 06.88	2.4182	14 46 08.8	7.514					
4	8 14 31.87	2.4149	14 38 35.2	7.607					
5	8 16 56.67	2.4116	14 30 56.0	7.697					
6	8 19 21.26	2.4081	14 23 11.5	7.787					
7	8 21 45.64	2.4047	14 15 21.6	7.876					
8	8 24 09.82	2.4013	14 07 26.4	7.963					

PHASES OF THE MOON.

		d	h	m
●	New Moon . . . August	3	08	17.2
☽	First Quarter	10	16	24.2
○	Full Moon	18	18	03.3
☾	Last Quarter	25	23	04.5

		d	h
☾	Perigee . . . . . . August	1	06.3
☾	Apogee	13	04.2
☾	Perigee	28	19.5

Continuing SATURDAY 30:

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
9	8 26 33.80	2.3978	13 59 26.0	8.049
10	8 28 57.56	2.3943	13 51 20.5	8.135
11	8 31 21.12	2.3908	13 43 09.8	8.219
12	8 33 44.46	2.3872	13 34 54.2	8.302
13	8 36 07.59	2.3837	13 26 33.6	8.383
14	8 38 30.51	2.3802	13 18 08.2	8.463
15	8 40 53.22	2.3767	13 09 38.0	8.542
16	8 43 15.72	2.3732	13 01 03.1	8.621
17	8 45 38.00	2.3695	12 52 23.5	8.698
18	8 48 00.06	2.3659	12 43 39.3	8.774
19	8 50 21.91	2.3623	12 34 50.6	8.848
20	8 52 43.54	2.3587	12 25 57.5	8.922
21	8 55 04.95	2.3550	12 17 00.0	8.993
22	8 57 26.14	2.3513	12 07 58.3	9.064
23	8 59 47.11	2.3477	11 58 52.3	9.135
24	9 02 07.87	+ 2.3442	N.11 49 42.1	− 9.203

| | | | GREENWICH MEAN TIME. | | | | | | | |
| | | | LUNAR DISTANCES. | | | | | | | |

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIʰ.	P. L. of Diff.	VIʰ.	P. L. of Diff.	IXʰ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
5	Sun	W.	22 31 43	2748	24 07 19	2755	25 42 46	2763	27 18 03	2771
	Antares	E.	93 46 29	2377	92 02 21	2393	90 18 36	2409	88 35 14	2426
6	Sun	W.	35 11 08	2832	36 44 54	2848	38 18 20	2862	39 51 27	2878
	Antares	E.	80 04 13	2509	78 23 12	2527	76 42 36	2543	75 02 23	2561
	Saturn	E.	124 54 13	2470	123 12 18	2487	121 30 46	2503	119 49 37	2520
7	Sun	W.	47 31 50	2962	49 02 50	2979	50 33 29	2996	52 03 47	3014
	Antares	E.	66 47 32	2652	65 09 48	2671	63 32 29	2689	61 55 35	2707
	Saturn	E.	111 29 35	2602	109 50 43	2619	108 12 14	2635	106 34 06	2652
	α Aquilæ	E.	116 07 47	3106	114 39 45	3111	113 11 49	3117	111 44 00	3123
8	Sun	W.	59 29 58	3098	60 58 10	3114	62 26 02	3130	63 53 35	3146
	Antares	E.	53 57 12	2801	52 22 45	2819	50 48 42	2838	49 15 03	2856
	Saturn	E.	98 29 00	2733	96 53 04	2748	95 17 28	2763	93 42 12	2779
	α Aquilæ	E.	104 27 01	3164	103 00 09	3175	101 33 30	3185	100 07 03	3197
	Jupiter	E.	117 27 07	2720	115 50 54	2735	114 15 01	2750	112 39 28	2765
9	Sun	W.	71 06 36	3223	72 32 18	3236	73 57 44	3251	75 22 53	3264
	Antares	E.	41 32 51	2951	40 01 37	2970	38 30 47	2992	37 00 24	3013
	Saturn	E.	85 50 44	2850	84 17 21	2864	82 44 16	2876	81 11 27	2890
	α Aquilæ	E.	92 58 17	3257	91 33 15	3270	90 08 28	3282	88 43 56	3295
	Jupiter	E.	104 46 23	2834	103 12 39	2847	101 39 12	2859	100 06 01	2872
10	Sun	W.	82 24 52	3325	83 48 34	3337	85 12 03	3347	86 35 20	3357
	Spica	W.	17 06 12	2967	18 37 06	2977	20 07 48	2985	21 38 20	2993
	Saturn	E.	73 31 24	2948	72 00 06	2959	70 29 02	2969	68 58 10	2979
	α Aquilæ	E.	81 45 11	3364	80 22 13	3378	78 59 31	3392	77 37 05	3406
	Jupiter	E.	92 23 56	2928	90 52 13	2939	89 20 43	2948	87 49 25	2958
	Fomalhaut	E.	111 55 19	3463	110 34 13	3463	109 13 08	3465	107 52 05	3466
11	Sun	W.	93 29 04	3400	94 51 20	3408	96 13 28	3415	97 35 28	3420
	Spica	W.	29 08 40	3027	30 38 19	3034	32 07 50	3039	33 37 15	3044
	Saturn	E.	61 26 46	3022	59 57 00	3029	58 27 23	3036	56 58 55	3042
	α Aquilæ	E.	70 49 01	3480	69 28 14	3496	68 07 45	3512	66 47 34	3528
	Jupiter	E.	80 15 41	2997	78 45 25	3005	77 15 18	3011	75 45 19	3017
	Fomalhaut	E.	101 07 09	3475	99 46 17	3478	98 25 28	3480	97 04 41	3483
	α Pegasi	E.	118 05 17	3254	116 40 12	3253	115 15 06	3252	113 49 58	3253
12	Sun	W.	104 23 57	3445	105 45 23	3447	107 06 46	3450	108 28 06	3452
	Spica	W.	41 02 49	3064	42 31 43	3067	44 00 33	3069	45 29 21	3071
	Saturn	E.	49 32 23	3069	48 03 36	3073	46 34 54	3078	45 06 17	3082
	α Aquilæ	E.	60 11 22	3620	58 53 09	3640	57 35 18	3662	56 17 50	3685
	Jupiter	E.	68 17 03	3040	66 47 40	3044	65 18 22	3047	63 49 07	3049
	Fomalhaut	E.	90 21 37	3497	89 01 10	3501	87 40 47	3505	86 20 28	3507
	α Pegasi	E.	106 44 36	3256	105 19 33	3257	103 54 31	3256	102 29 28	3256
13	Sun	W.	115 14 19	3457	116 35 31	3456	117 56 44	3456	119 17 57	3454
	Spica	W.	52 52 56	3073	54 21 38	3073	55 50 21	3071	57 19 06	3069
	Saturn	E.	37 44 16	3098	36 16 04	3101	34 47 55	3103	33 19 49	3106
	α Aquilæ	E.	49 57 09	3824	48 42 32	3858	47 28 30	3896	46 15 06	3937
	Jupiter	E.	56 23 33	3057	54 54 31	3058	53 25 30	3058	51 56 29	3058

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
5	Sun	W.	28 53 09	2780	30 28 03	2792	32 02 42	2805	33 37 04	2818
	Antares	E.	86 52 16	2441	85 09 40	2458	83 27 28	2475	81 45 39	2491
6	Sun	W.	41 24 14	2895	42 56 39	2911	44 28 44	2927	46 00 28	2945
	Antares	E.	73 22 35	2580	71 43 12	2598	70 04 14	2616	68 25 41	2634
	Saturn	E.	118 08 51	2536	116 28 28	2553	114 48 28	2569	113 08 50	2585
7.	Sun	W.	53 33 43	3030	55 03 18	3047	56 32 32	3065	58 01 25	3081
	Antares	E.	60 19 05	2726	58 43 00	2745	57 07 20	2763	55 32 04	2782
	Saturn	E.	104 56 21	2669	103 18 59	2684	101 41 58	2700	100 05 18	2716
	a Aquilæ	E.	110 16 18	3129	108 48 44	3138	107 21 20	3145	105 54 05	3154
8	Sun	W.	65 20 49	3163	66 47 43	3178	68 14 18	3193	69 40 36	3208
	Antares	E.	47 41 48	2875	46 08 57	2894	44 36 31	2913	43 04 29	2932
	Saturn	E.	92 07 16	2794	90 32 40	2808	88 58 23	2822	87 24 24	2837
	a Aquilæ	E.	98 40 50	3209	97 14 51	3220	95 49 05	3232	94 23 34	3244
	Jupiter	E.	111 04 14	2779	109 29 19	2794	107 54 43	2807	106 20 24	2821
9	Sun	W.	76 47 47	3277	78 12 25	3290	79 36 48	3302	81 00 57	3314
	Antares	E.	35 30 27	3034	34 00 57	3057	32 31 55	3081	31 03 22	3106
	Saturn	E.	79 38 55	2903	78 06 40	2915	76 34 40	2927	75 02 55	2938
	a Aquilæ	E.	87 19 39	3310	85 55 39	3323	84 31 54	3337	83 08 25	3350
	Jupiter	E.	98 33 06	2884	97 00 27	2896	95 28 03	2907	93 55 53	2917
10	Sun	W.	87 58 26	3366	89 21 21	3376	90 44 05	3385	92 06 39	3393
	Spica	W.	23 08 42	3000	24 38 55	3007	26 08 59	3014	27 38 54	3022
	Saturn	E.	67 27 31	2988	65 57 03	2997	64 26 47	3005	62 56 41	3014
	a Aquilæ	E.	76 14 55	3420	74 53 01	3436	73 31 25	3450	72 10 05	3464
	Jupiter	E.	86 18 19	2966	84 47 24	2975	83 16 40	2983	81 46 06	2990
	Fomalhaut	E.	106 31 03	3467	105 10 02	3468	103 49 02	3470	102 28 04	3472
11	Sun	W.	98 57 22	3426	100 19 09	3431	101 40 50	3436	103 02 26	3440
	Spica	W.	35 06 33	3049	36 35 45	3054	38 04 51	3058	39 33 52	3061
	Saturn	E.	55 28 34	3048	53 59 21	3054	52 30 15	3060	51 01 16	3065
	a Aquilæ	E.	65 27 41	3545	64 08 06	3563	62 48 51	3581	61 29 56	3600
	Jupiter	E.	74 15 27	3022	72 45 42	3027	71 16 03	3032	69 46 30	3037
	Fomalhaut	E.	95 43 58	3486	94 23 18	3488	93 02 41	3491	91 42 07	3495
	a Pegasi	E.	112 24 51	3254	110 59 46	3256	109 34 43	3255	108 09 39	3256
12	Sun	W.	109 49 24	3454	111 10 39	3455	112 31 53	3456	113 53 06	3456
	Spica	W.	46 58 06	3072	48 26 50	3073	49 55 32	3073	51 24 14	3073
	Saturn	E.	43 37 45	3085	42 09 17	3088	40 40 53	3091	39 12 33	3094
	a Aquilæ	E.	55 00 48	3709	53 44 11	3734	52 28 00	3763	51 12 19	3792
	Jupiter	E.	62 19 55	3052	60 50 46	3054	59 21 40	3056	57 52 36	3056
	Fomalhaut	E.	85 00 12	3511	83 40 00	3515	82 19 52	3518	80 59 48	3522
	a Pegasi	E.	101 04 25	3256	99 39 22	3255	98 14 18	3254	96 49 13	3253
13	Sun	W.	120 39 12	3453	122 00 29	3451	123 21 48	3448	124 43 10	3446
	Spica	W.	58 47 53	3068	60 16 42	3065	61 45 34	3062	63 14 30	3059
	Saturn	E.	31 51 47	3110	30 23 50	3114	28 55 58	3118	27 28 10	3123
	a Aquilæ	E.	45 02 24	3981	43 50 26	4031	42 39 17	4083	41 28 59	4143
	Jupiter	E.	50 27 28	3058	48 58 27	3057	47 29 25	3056	46 00 22	3056

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
13	Fomalhaut E.	79 39 48	3525	78 19 52	3531	77 00 02	3535	75 40 16	3529
	a Pegasi E.	95 24 07	3253	93 59 00	3251	92 33 51	3249	91 08 40	3247
14	Spica W.	64 43 30	3056	66 12 34	3052	67 41 42	3047	69 10 56	3043
	Antares W.	20 32 29	3382	21 55 06	3341	23 18 30	3306	24 42 35	3274
	a Aquilæ E.	40 19 39	4209	39 11 21	4282	38 04 12	4365	36 58 19	4455
	JUPITER E.	44 31 19	3055	43 02 14	3054	41 33 08	3052	40 04 00	3052
	Fomalhaut E.	69 02 49	3567	67 43 39	3575	66 24 37	3583	65 05 44	3590
	a Pegasi E.	84 02 11	3236	82 36 45	3234	81 11 16	3231	79 45 44	3229
15	Spica W.	76 38 40	3015	78 08 34	3009	79 38 36	3001	81 08 47	2995
	Antares W.	31 51 13	3158	33 18 13	3140	34 45 34	3124	36 13 15	3108
	JUPITER E.	32 38 04	3051	31 08 54	3052	29 39 45	3053	28 10 38	3057
	Fomalhaut E.	58 33 53	3648	57 16 10	3663	55 58 43	3681	54 41 36	3700
	a Pegasi E.	72 37 14	3214	71 11 22	3211	69 45 26	3209	68 19 27	3208
	a Arietis E.	115 56 23	3106	114 28 21	3098	113 00 09	3089	111 31 46	3080
16	Spica W.	88 41 55	2957	90 13 02	2948	91 44 20	2940	93 15 48	2931
	Antares W.	43 36 08	3039	45 05 32	3027	46 35 11	3014	48 05 06	3002
	a Pegasi E.	61 08 56	3198	59 42 44	3197	58 16 32	3197	56 50 19	3198
	a Arietis E.	104 07 08	3035	102 37 39	3026	101 07 59	3017	99 38 07	3009
17	Spica W.	100 55 56	2887	102 28 32	2876	104 01 21	2868	105 34 21	2858
	Antares W.	55 38 23	2944	57 09 46	2932	58 41 24	2921	60 13 16	2909
	a Pegasi E.	49 39 46	3214	48 13 54	3221	46 48 10	3230	45 22 36	3240
	a Arietis E.	92 05 54	2961	90 34 52	2951	89 03 38	2942	87 32 12	2933
18	Spica W.	113 22 30	2809	114 56 46	2800	116 31 14	2790	118 05 55	2780
	Antares W.	67 56 10	2855	69 29 26	2844	71 02 57	2833	72 36 42	2823
	SATURN W.	23 54 12	2891	25 26 43	2870	26 59 40	2851	28 33 02	2834
	a Pegasi E.	38 18 50	3334	36 55 18	3365	35 32 22	3400	34 10 06	3441
	a Arietis E.	79 52 07	2887	78 19 32	2878	76 46 45	2869	75 13 46	2861
	Aldebaran E.	112 57 34	2811	111 23 21	2801	109 48 55	2791	108 14 15	2781
19	Antares W.	80 28 50	2771	82 03 56	2762	83 39 14	2751	85 14 46	2741
	SATURN W.	36 25 08	2759	38 00 30	2746	39 36 09	2733	41 12 05	2721
	a Aquilæ W.	36 28 13	4087	37 38 27	3980	38 50 26	3884	40 04 02	3797
	JUPITER W.	18 38 49	2897	20 11 12	2862	21 44 20	2829	23 18 10	2799
	a Arietis E.	67 26 11	2820	65 52 09	2813	64 17 58	2806	62 43 38	2799
	Aldebaran E.	100 17 42	2732	98 41 45	2722	97 05 35	2713	95 29 12	2702
20	Antares W.	93 15 38	2695	94 52 25	2685	96 29 25	2676	98 06 37	2668
	SATURN W.	49 15 37	2666	50 53 03	2655	52 30 43	2645	54 08 37	2635
	a Aquilæ W.	46 32 08	3469	47 53 07	3418	49 15 03	3372	50 37 52	3328
	JUPITER W.	31 15 42	2694	32 52 30	2678	34 29 39	2663	36 07 09	2649
	a Arietis E.	54 49 53	2771	53 14 47	2766	51 39 35	2763	50 04 19	2762
	Aldebaran E.	87 24 02	2656	85 46 23	2646	84 08 31	2638	82 30 27	2628
21	Antares W.	106 15 26	2627	107 53 44	2619	109 32 13	2612	111 10 52	2604
	SATURN W.	62 21 36	2585	64 00 51	2577	65 40 18	2568	67 19 57	2559
	a Aquilæ W.	57 43 22	3154	59 10 26	3126	60 38 04	3101	62 06 13	3075
	JUPITER W.	44 19 06	2588	45 58 18	2577	47 37 44	2566	49 17 25	2556

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
13	Fomalhaut E .	74 20 35	3545	73 01 00	3549	71 41 30	3555	70 22 06	3561
	a Pegasi E .	89 43 27	3246	88 18 12	3243	86 52 54	3242	85 27 34	3239
14	Spica W .	70 40 16	3038	72 09 42	3033	73 39 14	3027	75 08 53	3021
	Antares W .	26 07 17	3244	27 32 34	3218	28 58 22	3196	30 24 36	3177
	a Aquilæ E .	35 53 47	4558	34 50 46	4673	33 49 24	4805	32 49 52	4955
	Jupiter E .	38 34 51	3050	37 05 40	3049	35 36 28	3049	34 07 16	3049
	Fomalhaut E .	63 46 59	3599	62 28 24	3610	61 10 01	3622	59 51 50	3635
	a Pegasi E .	78 20 09	3225	76 54 30	3223	75 28 48	3220	74 03 03	3217
15	Spica W .	82 39 06	2988	84 09 34	2981	85 40 11	2973	87 10 58	2965
	Antares W .	37 41 15	3093	39 09 33	3079	40 38 08	3065	42 07 00	3052
	Jupiter E .	26 41 36	3063	25 12 41	3069	23 43 54	3078	22 15 18	3090
	Fomalhaut E .	53 24 49	3719	52 08 22	3742	50 52 19	3769	49 36 45	3802
	a Pegasi E .	66 53 26	3204	65 27 22	3202	64 01 15	3200	62 35 06	3199
	a Arietis E .	110 03 12	3071	108 34 27	3063	107 05 32	3054	105 36 26	3044
16	Spica W .	94 47 27	2923	96 19 17	2914	97 51 18	2905	99 23 31	2895
	Antares W .	49 35 16	2990	51 05 41	2979	52 36 20	2967	54 07 14	2955
	a Pegasi E .	55 24 07	3199	53 57 57	3201	52 31 49	3204	51 05 45	3209
	a Arietis E .	98 08 04	2998	96 37 49	2,89	95 07 23	2979	93 36 44	2970
17	Spica W .	107 07 34	2848	108 40 59	2838	110 14 37	2829	111 48 27	2819
	Antares W .	61 45 23	2899	63 17 43	2887	64 50 18	2876	66 23 07	2866
	a Pegasi E .	43 57 14	3253	42 32 08	3269	41 07 20	3286	39 42 52	3308
	a Arietis E .	86 00 35	2923	84 28 45	2914	82 56 44	2905	81 24 31	2896
18	Spica W .	119 40 49	2770	121 15 56	2761	122 51 15	2751	124 26 47	2741
	Antares W .	74 10 40	2812	75 44 52	2801	77 19 18	2792	78 53 57	2781
	Saturn W .	30 06 46	2817	31 40 52	2801	33 15 18	2786	34 50 04	2772
	a Pegasi E .	32 48 36	3493	31 28 04	3553	30 08 38	3623	28 50 29	3704
	a Arietis E .	73 40 37	2852	72 07 16	2844	70 33 45	2835	69 00 03	2828
	Aldebaran E .	106 39 22	2771	105 04 16	2762	103 28 58	2751	101 53 26	2742
19	Antares W .	86 50 31	2732	88 26 29	2722	90 02 39	2713	91 39 02	2703
	Saturn W .	42 48 17	2710	44 24 44	2698	46 01 27	2687	47 38 25	2676
	a Aquilæ W .	41 19 07	3720	42 35 33	3648	43 53 16	3583	45 12 09	3523
	Jupiter W .	24 52 39	2772	26 27 43	2750	28 03 17	2730	29 39 17	2711
	a Arietis E .	61 09 09	2793	59 34 32	2786	57 59 46	2781	56 24 53	2775
	Aldebaran E .	93 52 35	2693	92 15 46	2684	90 38 44	2674	89 01 29	2665
20	Antares W .	99 44 00	2659	101 21 35	2651	102 59 21	2643	104 37 18	2635
	Saturn W .	55 46 45	2624	57 25 08	2614	59 03 44	2604	60 42 34	2595
	a Aquilæ W .	52 01 31	3288	53 25 56	3252	54 51 04	3216	56 16 54	3184
	Jupiter W .	37 44 58	2635	39 23 05	2624	41 01 28	2610	42 40 09	2599
	a Arietis E .	48 29 01	2760	46 53 40	2758	45 18 17	2758	43 42 54	2760
	Aldebaran E .	80 52 10	2620	79 13 42	2610	77 35 01	2601	75 56 08	2593
21	Antares W .	112 49 41	2598	114 28 39	2591	116 07 47	2584	117 47 04	2577
	Saturn W .	68 59 48	2551	70 39 50	2543	72 20 03	2535	74 00 28	2527
	a Aquilæ W .	63 34 53	3052	65 04 01	3031	66 33 35	3010	68 03 35	2990
	Jupiter W .	50 57 21	2546	52 37 30	2537	54 17 52	2527	55 58 27	2518

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
21	α Arietis E.	42 07 34	2762	40 32 16	2766	38 57 04	2772	37 21 59	2781
	Aldebaran E.	74 17 03	2585	72 37 47	2576	70 58 19	2567	69 18 39	2559
22	Saturn W.	75 41 04	2518	77 21 52	2510	79 02 52	2502	80 44 03	2494
	α Aquilæ W.	69 34 00	2973	71 04 47	2956	72 35 55	2940	74 07 23	2924
	Jupiter W.	57 39 15	2510	59 20 15	2500	61 01 28	2492	62 42 53	2483
	Aldebaran E.	60 57 33	2520	59 16 47	2512	57 35 51	2504	55 54 43	2497
	Venus E.	115 28 48	2951	113 57 34	2943	112 26 10	2934	110 54 34	2924
23	Saturn W.	89 12 34	2458	90 54 47	2450	92 37 10	2443	94 19 43	2436
	α Aquilæ W.	81 49 09	2862	83 22 16	2853	84 55 35	2843	86 29 07	2835
	Jupiter W.	71 12 49	2444	72 55 21	2437	74 38 03	2429	76 20 56	2422
	Aldebaran E.	47 26 31	2461	45 44 23	2454	44 02 05	2447	42 19 37	2441
	Mars E.	90 57 13	2689	89 20 23	2683	87 43 20	2675	86 06 07	2668
	Venus E.	103 13 50	2883	101 41 10	2875	100 08 19	2867	98 35 18	2859
	Sun E.	128 06 20	2795	126 31 45	2786	124 56 59	2777	123 22 01	2769
24	Saturn W.	102 54 53	2403	104 38 23	2398	106 22 01	2391	108 05 48	2385
	α Aquilæ W.	94 19 12	2803	95 53 36	2799	97 28 05	2795	99 02 39	2793
	Jupiter W.	84 57 56	2387	86 41 49	2380	88 25 52	2374	90 10 04	2368
	Aldebaran E.	33 45 02	2410	32 01 41	2404	30 18 12	2398	28 34 35	2394
	Mars E.	77 57 37	2633	76 19 27	2626	74 41 08	2620	73 02 40	2614
	Venus E.	90 47 46	2822	89 13 47	2816	87 39 40	2808	86 05 23	2801
	Sun E.	115 24 36	2730	113 48 36	2722	112 12 26	2714	110 36 05	2707
25	Jupiter W.	98 53 18	2337	100 38 23	2332	102 23 36	2326	104 08 57	2321
	Mars E.	64 48 15	2584	63 08 58	2579	61 29 34	2573	59 50 02	2567
	Venus E.	78 11 41	2768	76 36 31	2761	75 01 12	2755	73 25 45	2750
	Sun E.	102 32 01	2672	100 54 44	2666	99 17 19	2659	97 39 44	2652
26	Jupiter W.	112 57 36	2296	114 43 41	2292	116 29 52	2287	118 16 10	2283
	α Arietis W.	29 24 28	2623	31 02 52	2588	32 42 03	2557	34 21 57	2528
	Venus E.	65 26 37	2721	63 50 25	2716	62 14 07	2711	60 37 42	2707
	Sun E.	89 29 40	2622	87 51 15	2616	86 12 42	2610	84 34 01	2605
27	α Arietis W.	42 49 58	2429	44 32 52	2415	46 16 06	2401	47 59 39	2389
	Venus E.	52 34 11	2687	50 57 13	2684	49 20 12	2681	47 43 07	2680
	Sun E.	76 18 49	2580	74 39 27	2576	72 59 59	2572	71 20 25	2568
28	α Arietis W.	56 41 10	2345	58 26 04	2338	60 11 08	2332	61 56 21	2326
	Aldebaran W.	22 47 45	2253	24 34 54	2248	26 22 10	2244	28 09 32	2241
	Venus E.	39 37 14	2676	38 00 02	2678	36 22 52	2679	34 45 44	2683
	Sun E.	63 01 21	2552	61 21 20	2550	59 41 16	2548	58 01 09	2545
29	α Arietis W.	70 44 01	2309	72 29 47	2308	74 15 35	2307	76 01 25	2306
	Aldebaran W.	37 07 23	2231	38 55 04	2231	40 42 46	2230	42 30 29	2230
	Sun E.	49 40 09	2543	47 59 56	2545	46 19 45	2545	44 39 35	2548
30	α Arietis W.	84 50 34	2311	86 36 17	2314	88 21 56	2316	90 07 32	2320
	Aldebaran W.	51 28 48	2237	53 16 20	2240	55 03 48	2243	56 51 12	2246
	Sun E.	36 19 37	2565	34 39 54	2571	33 00 19	2577	31 20 52	2584

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVʰ.	P. L. of Diff.	XVIIIʰ.	P. L. of Diff.	XXIʰ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
21	α Arietis	E .	35 47 06	2792	34 12 28	2806	32 38 08	2823	31 04 10	2843
	Aldebaran	E .	67 38 48	2551	65 58 46	2543	64 18 33	2535	62 38 08	2527
22	SATURN	W.	82 25 24	2487	84 06 56	2480	85 48 38	2472	87 30 31	2465
	α Aquilæ	W.	75 39 11	2911	77 11 16	2898	78 43 38	2885	80 16 16	2873
	JUPITER	W.	64 24 30	2475	66 06 18	2467	67 48 17	2459	69 30 28	2452
	Aldebaran	E .	54 13 25	2489	52 31 57	2482	50 50 19	2475	49 08 30	2467
	VENUS	E .	109 22 46	2916	107 50 48	2909	106 18 40	2899	104 46 20	2891
23	SATURN	W.	96 02 26	2429	97 45 19	2423	99 28 21	2417	101 11 32	2410
	α Aquilæ	W.	88 02 50	2827	89 36 43	2821	91 10 44	2814	92 44 54	2808
	JUPITER	W.	78 04 00	2415	79 47 14	2408	81 30 38	2401	83 14 12	2394
	Aldebaran	E .	40 37 00	2434	38 54 14	2428	37 11 19	2422	35 28 15	2415
	MARS	E .	84 28 44	2660	82 51 11	2654	81 13 29	2647	79 35 38	2640
	VENUS	E .	97 02 07	2852	95 28 46	2845	93 55 16	2837	92 21 36	2829
	SUN	E .	121 46 53	2762	120 11 35	2753	118 36 06	2745	117 00 26	2738
24	SATURN	W.	109 49 44	2380	111 33 48	2373	113 18 01	2368	115 02 22	2362
	α Aquilæ	W.	100 37 16	2792	102 11 55	2791	103 46 35	2791	105 21 15	2790
	JUPITER	W.	91 54 25	2362	93 38 55	2355	95 23 34	2349	97 08 22	2344
	Aldebaran	E .	26 50 51	2389	25 07 01	2385	23 23 05	2380	21 39 02	2376
	MARS	E .	71 24 04	2607	69 45 19	2601	68 06 26	2595	66 27 24	2590
	VENUS	E .	84 30 56	2794	82 56 20	2788	81 21 36	2781	79 46 43	2774
	SUN	E .	108 59 35	2701	107 22 56	2693	105 46 07	2687	104 09 09	2679
25	JUPITER	W.	105 54 26	2316	107 40 02	2311	109 25 46	2305	111 11 38	2301
	MARS	E .	58 10 22	2563	56 30 36	2559	54 50 45	2554	53 10 47	2548
	VENUS	E .	71 50 11	2744	70 14 29	2738	68 38 39	2732	67 02 42	2726
	SUN	E .	96 02 00	2646	94 24 08	2640	92 46 07	2634	91 07 58	2627
26	JUPITER	W.	120 02 34	2280	121 49 03	2277	123 35 36	2273	125 22 15	2269
	α Arietis	W.	36 02 31	2503	37 43 40	2481	39 25 20	2462	41 07 27	2445
	VENUS	E .	59 01 11	2702	57 24 34	2698	55 47 52	2694	54 11 04	2690
	SUN	E .	82 55 13	2599	81 16 17	2595	79 37 15	2589	77 58 05	2585
27	α Arietis	W.	49 43 29	2379	51 27 34	2369	53 11 53	2359	54 56 26	2352
	VENUS	E .	46 06 00	2678	44 28 50	2677	42 51 39	2676	41 14 27	2675
	SUN	E .	69 40 46	2564	68 01 01	2561	66 21 12	2557	64 41 18	2555
28	α Arietis	W.	63 41 42	2322	65 27 09	2319	67 12 41	2315	68 58 19	2312
	Aldebaran	W.	29 56 59	2238	31 44 30	2235	33 32 05	2233	35 19 43	2232
	VENUS	E .	33 08 41	2688	31 31 45	2693	29 54 56	2700	28 18 16	2708
	SUN	E .	56 20 59	2545	54 40 48	2543	53 00 35	2543	51 20 22	2543
29	α Arietis	W.	77 47 16	2306	79 33 07	2306	81 18 58	2307	83 04 47	2309
	Aldebaran	W.	44 18 12	2231	46 05 54	2232	47 53 34	2233	49 41 12	2235
	SUN	E .	42 59 28	2550	41 19 24	2552	39 39 23	2556	37 59 27	2560
30	α Arietis	W.	91 53 03	2324	93 38 27	2330	95 23 43	2335	97 08 52	2340
	Aldebaran	W.	58 38 31	2250	60 25 44	2256	62 12 49	2260	63 59 48	2264
	SUN	E .	29 41 35	2593	28 02 30	2602	26 23 38	2612	24 45 00	2624

AT GREENWICH APPARENT NOON.

Day of the Week	Day of the Month	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian	Equation of Time, to be Added to Subtracted from Apparent Time.	Diff for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	10 39 01.00	+9.083	N. 8 32 11.9	−54.22	15 52.26	64.35	0 09.68	0.771
Tues.	2	10 42 38.83	9.070	8 10 26.5	54.56	15 52.49	64.30	0 08.99	0.784
Wed.	3	10 46 16.38	9.058	7 48 33.2	54.88	15 52.72	64.26	0 27.95	0.796
Thur.	4	10 49 53.64	+9.047	7 26 32.4	−55.19	15 52.96	64.22	0 47.19	0.807
Frid.	5	10 53 30.64	9.036	7 04 24.5	55.48	15 53.18	64.19	1 06.68	0.818
Sat.	6	10 57 07.38	9.026	6 42 09.7	55.76	15 53.42	64.15	1 26.44	0.828
SUN.	7	11 00 43.89	+9.017	6 19 48.3	−56.02	15 53.66	64.12	1 46.43	0.838
Mon.	8	11 04 20.18	9.008	5 57 21.0	56.27	15 53.90	64.09	2 06.64	0.846
Tues.	9	11 07 56.27	9.000	5 34 47.4	56.51	15 54.14	64.07	2 27.05	0.854
Wed.	10	11 11 32.17	+8.992	5 12 08.4	−56.73	15 54.39	64.05	2 47.64	0.861
Thur.	11	11 15 07.91	8.986	4 49 24.3	56.94	15 54.64	64.03	3 08.39	0.868
Frid.	12	11 18 43.51	8.981	4 26 35.2	57.14	15 54.89	64.01	3 29.30	0.873
Sat.	13	11 22 18.98	+8.976	4 03 41.7	−57.33	15 55.15	64.00	3 50.32	0.878
SUN.	14	11 25 54.35	8.972	3 40 43.7	57.50	15 55.41	63.99	4 11.45	0.882
Mon.	15	11 29 29.63	8.969	3 17 42.0	57.66	15 55.67	63.98	4 32.65	0.885
Tues.	16	11 33 04.86	+8.967	2 54 36.5	−57.80	15 55.93	63.97	4 53.92	0.887
Wed.	17	11 36 40.04	8.966	2 31 27.9	57.93	15 56.19	63.97	5 15.23	0.888
Thur.	18	11 40 15.22	8.966	2 08 16.2	58.05	15 56.45	63.97	5 36.55	0.887
Frid.	19	11 43 50.40	+8.967	1 45 01.8	−58.15	15 56.71	63.97	5 57.85	0.886
Sat.	20	11 47 25.63	8.969	1 21 45.1	58.24	15 56.97	63.97	6 19.12	0.884
SUN.	21	11 51 00.92	8.972	0 58 26.3	58.32	15 57.24	63.98	6 40.32	0.882
Mon.	22	11 54 36.29	+8.976	0 35 05.8	−58.39	15 57.50	63.99	7 01.45	0.878
Tues.	23	11 58 11.77	8.981	N. 0 11 43.9	58.44	15 57.77	64.01	7 22.46	0.873
Wed.	24	12 01 47.39	8.987	S. 0 11 39.1	58.48	15 58.04	64.03	7 43.34	0.867
Thur.	25	12 05 23.15	+8.994	0 35 02.8	−58.50	15 58.31	64.05	8 04.07	0.860
Frid.	26	12 08 59.08	9.001	0 58 26.8	58.51	15 58.58	64.07	8 24.63	0.853
Sat.	27	12 12 35.20	9.010	1 21 50.9	58.50	15 58.85	64.10	8 45.00	0.845
SUN.	28	12 16 11.54	+9.019	1 45 14.5	−58.48	15 59.12	64.13	9 05.17	0.836
Mon.	29	12 19 48.10	9.029	2 08 37.5	58.44	15 59.40	64.17	9 25.11	0.826
Tues.	30	12 23 24.91	9.039	2 31 59.5	58.39	15 59.67	64.20	9 44.80	0.815
Wed.	31	12 27 01.98	+9.050	S. 2 55 20.0	−58.32	15 59.95	64.24	10 04.22	0.804

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting 0.18ˢ from the sidereal time. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing, south declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week	Day of the Month	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	m s	s	h m s
Mon.	1	10 39 00.98	+ 9.085	N. 8 32 12.0	− 54.23	0 09.68	+ 0.771	10 38 51.30
Tues.	2	10 42 38.86	9.072	8 10 26.3	54.57	0 08.99	0.784	10 42 47.85
Wed.	3	10 46 16.45	9.060	7 48 32.8	54.89	0 27.96	0.796	10 46 44.41
Thur.	4	10 49 53.76	+ 9.049	7 26 31.7	− 55.20	0 47.20	+ 0.807	10 50 40.96
Frid.	5	10 53 30.81	9.038	7 04 23.4	55.49	1 06.70	0.818	10 54 37.51
Sat.	6	10 57 07.60	9.028	6 42 08.3	55.77	1 26.46	0.828	10 58 34.06
SUN.	7	11 00 44.16	+ 9.019	6 19 46.6	− 56.03	1 46.46	+ 0.838	11 02 30.62
Mon.	8	11 04 20.50	9.010	5 57 18.8	56.28	2 06.67	0.846	11 06 27.17
Tues.	9	11 07 56.63	9.002	5 34 45.1	56.52	2 27.09	0.854	11 10 23.72
Wed.	10	11 11 32.59	+ 8.995	5 12 05.8	− 56.74	2 47.68	+ 0.861	11 14 20.27
Thur.	11	11 15 08.38	8.989	4 49 21.3	56.95	3 08.44	0.868	11 18 16.82
Frid.	12	11 18 44.03	8.983	4 26 31.9	57.15	3 29.35	0.873	11 22 13.38
Sat.	13	11 22 19.55	+ 8.978	4 03 38.0	− 57.34	3 50.38	+ 0.878	11 26 09.93
SUN.	14	11 25 54.97	8.974	3 40 39.7	57.51	4 11.51	0.882	11 30 06.48
Mon.	15	11 29 30.31	8.971	3 17 37.6	57.67	4 32.72	0.885	11 34 03.03
Tues.	16	11 33 05.59	+ 8.969	2 54 31.8	− 57.81	4 53.99	+ 0.887	11 37 59.58
Wed.	17	11 36 40.83	8.968	2 31 22.8	57.94	5 15.31	0.888	11 41 56.14
Thur.	18	11 40 16.06	8.968	2 08 10.7	58.06	5 36.63	0.887	11 45 52.69
Frid.	19	11 43 51.30	+ 8.969	1 44 56.0	− 58.16	5 57.94	+ 0.886	11 49 49.24
Sat.	20	11 47 26.58	8.971	1 21 38.9	58.25	6 19.21	0.884	11 53 45.79
SUN.	21	11 51 01.92	8.974	0 58 19.8	58.33	6 40.42	0.882	11 57 42.34
Mon.	22	11 54 37.35	+ 8.978	0 34 58.9	− 58.40	7 01.55	+ 0.878	12 01 38.90
Tues.	23	11 58 12.88	8.983	N. 0 11 36.7	58.45	7 22.57	0.873	12 05 35.45
Wed.	24	12 01 48.55	8.989	S. 0 11 46.6	58.49	7 43.45	0.867	12 09 32.00
Thur.	25	12 05 24.36	+ 8.996	0 35 10.6	− 58.51	8 04.19	+ 0.860	12 13 28.55
Frid.	26	12 09 00.35	9.004	0 58 35.0	58.52	8 24.75	0.853	12 17 25.10
Sat.	27	12 12 36.52	9.012	1 21 59.4	58.51	8 45.13	0.845	12 21 21.66
SUN.	28	12 16 12.91	+ 9.021	1 45 23.4	− 58.49	9 05.30	+ 0.836	12 25 18.21
Mon.	29	12 19 49.52	9.031	2 08 46.7	58.45	9 25.24	0.826	12 29 14.76
Tues.	30	12 23 26.38	9.041	2 32 09.0	58.40	9 44.93	0.815	12 33 11.31
Wed.	31	12 27 03.50	+ 9.052	S. 2 55 29.8	− 58.33	10 04.36	+ 0.804	12 37 07.86

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

Diff. for 1 Hour, + 9.8565ˢ. (Table III.)

		AT GREENWICH MEAN NOON.						
		THE SUN'S						
Day of the Month.	Day of the Year.	TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		λ	λ'					
		° ′ ″	′ ″	″	″			h m s
1	244	158 06 12.1	05 29.8	145.26	− 0.26	0.003 8922	− 42.9	13 18 57.45
2	245	159 04 19.3	03 36.9	145.33	0.18	0.003 7883	43.7	13 15 01.54
3	246	160 02 28.2	01 45.7	145.40	− 0.06	0.003 6826	44.4	13 11 05.64
4	247	160 60 38.7	59 56.1	145.47	+ 0.05	0.003 5752	− 45.1	13 07 09.73
5	248	161 58 50.8	58 08.0	145.54	0.18	0.003 4663	45.7	13 03 13.82
6	249	162 57 04.4	56 21.6	145.60	0.30	0.003 3558	46.3	12 59 17.92
7	250	163 55 19.5	54 36.6	145.67	+ 0.42	0.003 2439	− 46.8	12 55 22.01
8	251	164 53 36.2	52 53.2	145.73	0.54	0.003 1309	47.3	12 51 26.11
9	252	165 51 54.4	51 11.3	145.80	0.64	0.003 0167	47.8	12 47 30.20
10	253	166 50 14.2	49 31.0	145.86	+ 0.70	0.002 9015	− 48.2	12 43 34.29
11	254	167 48 35.4	47 52.2	145.93	0.76	0.002 7856	48.5	12 39 38.39
12	255	168 46 58.4	46 15.0	145.99	0.80	0.002 6689	48.7	12 35 42.48
13	256	169 45 22.9	44 39.5	146.06	+ 0.79	0.002 5516	− 48.9	12 31 46.57
14	257	170 43 49.0	43 05.6	146.13	0.76	0.002 4339	49.1	12 27 50.67
15	258	171 42 16.9	41 33.3	146.20	0.71	0.002 3158	49.2	12 23 54.76
16	259	172 40 46.5	40 02.9	146.27	+ 0.63	0.002 1974	− 49.3	12 19 58.86
17	260	173 39 18.0	38 34.2	146.35	0.53	0.002 0791	49.4	12 16 02.95
18	261	174 37 51.3	37 07.5	146.43	0.39	0.001 9604	49.4	12 12 07.04
19	262	175 36 26.6	35 42.7	146.51	+ 0.26	0.001 8419	− 49.4	12 08 11.14
20	263	176 35 04.0	34 20.0	146.60	+ 0.12	0.001 7233	49.4	12 04 15.23
21	264	177 33 43.5	32 59.4	146.69	− 0.01	0.001 6047	49.4	12 00 19.33
22	265	178 32 25.2	31 41.0	146.78	− 0.15	0.001 4860	− 49.5	11 56 23.42
23	266	179 31 09.1	30 24.9	146.87	0.26	0.001 3671	49.6	11 52 27.52
24	267	180 29 55.3	29 11.0	146.97	0.34	0.001 2479	49.8	11 48 31.61
25	268	181 28 43.8	27 59.4	147.06	− 0.39	0.001 1282	50.0	11 44 35.70
26	269	182 27 34.6	26 50.1	147.16	0.40	0.001 0081	50.2	11 40 39.80
27	270	183 26 27.7	25 43.1	147.26	0.39	0.000 8873	50.5	11 36 43.89
28	271	184 25 23.0	24 38.4	147.35	− 0.36	0.000 7658	− 50.8	11 32 47.98
29	272	185 24 20.6	23 35.9	147.44	0.28	0.000 6436	51.1	11 28 52.08
30	273	186 23 20.3	22 35.6	147.53	0.19	0.000 5206	51.4	11 24 56.17
31	274	187 22 22.2	21 37.3	147.62	− 0.07	0.000 3967	· 51.7	11 21 00.27

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' to the mean equinox of January 0.0ᵈ of the Besselian fictitious year.

Diff. for 1 Hour,
— 9.8296ˢ.
(Table II.)

	GREENWICH MEAN TIME.							
	THE MOON'S							
Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 03.5	15 59.1	58 50.1	− 1.26	58 34.0	− 1.42	☾		28.7
2	15 54.2	15 48.9	58 16.0	1.57	57 56.6	1.67	0 08.0	+ 2.09	0.3
3	15 43.3	15 37.5	57 36.0	1.75	57 14.6	1.79	0 57.3	2.02	1.3
4	15 31.6	15 25.7	56 53.0	− 1.80	56 31.4	− 1.78	1 45.4	+ 1.98	2.3
5	15 20.0	15 14.5	56 10.4	1.72	55 50.2	1.62	2 32.6	1.96	3.3
6	15 09.3	15 04.6	55 31.3	1.50	55 14.0	1.36	3 19.6	1.96	4.3
7	15 00.4	14 56.7	54 58.5	− 1.20	54 45.1	− 1.02	4 06.6	+ 1.96	5.3
8	14 53.7	14 51.3	54 34.0	0.83	54 25.3	0.62	4 53.8	1.97	6.3
9	14 49.6	14 48.6	54 19.1	− 0.41	54 15.5	− 0.19	5 41.3	1.98	7.3
10	14 48.4	14 48.8	54 14.5	+ 0.03	54 16.1	+ 0.24	6 28.9	+ 1.99	8.3
11	14 49.9	14 51.7	54 20.2	0.45	54 26.8	0.65	7 16.5	1.98	9.3
12	14 54.2	14 57.2	54 35.8	0.83	54 46.9	1.01	8 04.0	1.97	10.3
13	15 00.8	15 04.8	55 00.0	+ 1.16	55 14.8	+ 1.30	8 51.3	+ 1.97	11.3
14	15 09.3	15 14.0	55 31.2	1.41	55 48.7	1.50	9 38.4	1.96	12.3
15	15 19.1	15 24.3	56 07.2	1.55	56 26.1	1.59	10 25.6	1.97	13.3
16	15 29.5	15 34.7	56 45.4	+ 1.60	57 04.4	+ 1.57	11 13.1	+ 1.99	14.3
17	15 39.8	15 44.6	57 23.1	1.52	57 40.9	1.44	12 01.4	2.04	15.3
18	15 49.2	15 53.4	57 57.7	1.35	58 13.3	1.23	12 51.0	2.10	16.3
19	15 57.3	16 00.6	58 27.3	+ 1.10	58 39.6	+ 0.96	13 42.3	+ 2.18	17.3
20	16 03.5	16 06.0	58 50.3	0.81	58 59.2	0.67	14 35.8	2.27	18.3
21	16 07.9	16 09.4	59 06.3	0.52	59 11.7	0.38	15 31.3	2.35	19.3
22	16 10.4	16 11.0	59 15.5	+ 0.25	59 17.8	+ 0.13	16 28.6	+ 2.41	20.3
23	16 11.2	16 11.1	59 18.6	+ 0.01	59 18.1	− 0.10	17 26.8	2.42	21.3
24	16 10.6	16 09.8	59 16.3	− 0.20	59 13.3	0.29	18 24.7	2.39	22.3
25	16 08.7	16 07.3	59 09.2	− 0.39	59 04.0	− 0.48	19 21.4	+ 2.32	23.3
26	16 05.5	16 03.5	58 57.7	0.57	58 50.3	0.66	20 16.2	2.24	24.3
27	16 01.2	15 58.6	58 41.7	0.76	58 32.1	0.85	21 08.9	2.15	25.3
28	15 55.6	15 52.3	58 21.2	− 0.95	58 09.3	− 1.04	21 59.6	+ 2.08	26.3
29	15 48.8	15 44.9	57 56.2	1.13	57 42.0	1.22	22 48.7	2.02	27.3
30	15 40.8	15 36.5	57 26.9	1.29	57 11.0	1.35	23 36.7	+ 1.99	28.3
31	15 32.0	15 27.3	56 54.4	− 1.40	56 37.4	− 1.43	☾		29.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 1.

Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ' ")	Diff. for 1 Minute. (")
0	9 57 20.65	+ 2.2578	N. 7 52 10.9	− 10.470
1	9 59 36.02	2.2544	7 41 41.6	10.507
2	10 01 51.18	2.2509	7 31 10.1	10.542
3	10 04 06.13	2.2475	7 20 36.5	10.577
4	10 06 20.88	2.2442	7 10 00.8	10.611
5	10 08 35.43	2.2408	6 59 23.2	10.642
6	10 10 49.78	2.2375	6 48 43.7	10.673
7	10 13 03.93	2.2342	6 38 02.4	10.703
8	10 15 17.88	2.2309	6 27 19.3	10.732
9	10 17 31.64	2.2277	6 16 34.5	10.759
10	10 19 45.20	2.2244	6 05 48.2	10.785
11	10 21 58.57	2.2212	5 55 00.3	10.810
12	10 24 11.74	2.2179	5 44 11.0	10.833
13	10 26 24.72	2.2148	5 33 20.3	10.856
14	10 28 37.52	2.2117	5 22 28.3	10.877
15	10 30 50.13	2.2086	5 11 35.0	10.897
16	10 33 02.55	2.2055	5 00 40.6	10.916
17	10 35 14.79	2.2025	4 49 45.1	10.933
18	10 37 26.85	2.1994	4 38 48.6	10.950
19	10 39 38.72	2.1964	4 27 51.1	10.966
20	10 41 50.42	2.1935	4 16 52.7	10.980
21	10 44 01.94	2.1905	4 05 53.5	10.992
22	10 46 13.28	2.1876	3 54 53.6	11.004
23	10 48 24.45	+ 2.1847	N. 3 43 53.0	− 11.015

TUESDAY 2.

Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ' ")	Diff. for 1 Minute. (")
0	10 50 35.45	+ 2.1819	N. 3 32 51.8	− 11.024
1	10 52 46.28	2.1791	3 21 50.1	11.032
2	10 54 56.94	2.1763	3 10 47.9	11.040
3	10 57 07.44	2.1736	2 59 45.3	11.047
4	10 59 17.77	2.1708	2 48 42.3	11.052
5	11 01 27.94	2.1682	2 37 39.1	11.055
6	11 03 37.95	2.1655	2 26 35.7	11.058
7	11 05 47.80	2.1628	2 15 32.1	11.060
8	11 07 57.49	2.1602	2 04 28.5	11.060
9	11 10 07.03	2.1577	1 53 24.9	11.060
10	11 12 16.42	2.1552	1 42 21.3	11.058
11	11 14 25.65	2.1527	1 31 17.8	11.057
12	11 16 34.74	2.1502	1 20 14.5	11.052
13	11 18 43.68	2.1478	1 09 11.5	11.047
14	11 20 52.48	2.1455	0 58 08.8	11.042
15	11 23 01.14	2.1431	0 47 06.5	11.035
16	11 25 09.65	2.1407	0 36 04.6	11.027
17	11 27 18.03	2.1385	0 25 03.2	11.018
18	11 29 26.27	2.1362	0 14 02.4	11.008
19	11 31 34.38	2.1340	N. 0 03 01.7	10.998
20	11 33 42.35	2.1318	S. 0 07 57.4	10.987
21	11 35 50.19	2.1297	0 18 56.2	10.973
22	11 37 57.91	2.1276	0 29 54.2	10.959
23	11 40 05.50	2.1254	0 40 51.3	10.944
24	11 42 12.96	+ 2.1233	S. 0 51 47.5	− 10.929

WEDNESDAY 3.

Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ' ")	Diff. for 1 Minute. (")
0	11 42 12.96	+ 2.1233	S. 0 51 47.5	− 10.929
1	11 44 20.30	2.1214	1 02 42.8	10.912
2	11 46 27.53	2.1195	1 13 37.0	10.894
3	11 48 34.64	2.1175	1 24 30.1	10.876
4	11 50 41.63	2.1156	1 35 22.1	10.856
5	11 52 48.51	2.1137	1 46 12.8	10.835
6	11 54 55.27	2.1118	1 57 02.3	10.814
7	11 57 01.93	2.1101	2 07 50.5	10.792
8	11 59 08.48	2.1082	2 18 37.4	10.769
9	12 01 14.92	2.1065	2 29 22.8	10.744
10	12 03 21.26	2.1048	2 40 06.7	10.719
11	12 05 27.50	2.1032	2 50 49.1	10.692
12	12 07 33.64	2.1015	3 01 29.8	10.666
13	12 09 39.68	2.0999	3 12 09.0	10.639
14	12 11 45.63	2.0983	3 22 46.5	10.610
15	12 13 51.48	2.0967	3 33 22.2	10.580
16	12 15 57.24	2.0953	3 43 56.1	10.550
17	12 18 02.92	2.0939	3 54 28.2	10.519
18	12 20 08.51	2.0924	4 04 58.4	10.487
19	12 22 14.01	2.0910	4 15 26.7	10.455
20	12 24 19.43	2.0897	4 25 53.0	10.421
21	12 26 24.77	2.0883	4 36 17.2	10.387
22	12 28 30.03	2.0870	4 46 39.4	10.352
23	12 30 35.21	+ 2.0857	S. 4 56 59.4	− 10.315

THURSDAY 4.

Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ' ")	Diff. for 1 Minute. (")
0	12 32 40.32	+ 2.0846	S. 5 07 17.2	− 10.278
1	12 34 45.36	2.0833	5 17 32.8	10.242
2	12 36 50.32	2.0821	5 27 46.2	10.203
3	12 38 55.21	2.0810	5 37 57.2	10.164
4	12 41 00.04	2.0799	5 48 05.9	10.124
5	12 43 04.80	2.0788	5 58 12.1	10.083
6	12 45 09.50	2.0777	6 08 15.9	10.042
7	12 47 14.13	2.0767	6 18 17.2	10.001
8	12 49 18.71	2.0758	6 28 16.0	9.958
9	12 51 23.23	2.0748	6 38 12.2	9.914
10	12 53 27.69	2.0739	6 48 05.7	9.870
11	12 55 32.10	2.0730	6 57 56.6	9.826
12	12 57 36.45	2.0721	7 07 44.8	9.780
13	12 59 40.75	2.0713	7 17 30.2	9.734
14	13 01 45.01	2.0706	7 27 12.9	9.687
15	13 03 49.22	2.0697	7 36 52.7	9.639
16	13 05 53.38	2.0690	7 46 29.6	9.591
17	13 07 57.50	2.0682	7 56 03.6	9.542
18	13 10 01.57	2.0675	8 05 34.7	9.493
19	13 12 05.60	2.0669	8 15 02.8	9.442
20	13 14 09.60	2.0663	8 24 27.8	9.392
21	13 16 13.56	2.0657	8 33 49.8	9.341
22	13 18 17.49	2.0652	8 43 08.7	9.289
23	13 20 21.38	2.0645	8 52 24.5	9.236
24	13 22 25.23	+ 2.0639	S. 9 01 37.0	− 9.182

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 5.					**SUNDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 22 25.23	+ 2.0639	S. 9 01 37.0	− 9.182	0	15 01 18.04	+ 2.0627	S. 15 11 02.7	− 6.036
1	13 24 29.05	2.0635	9 10 46.3	9.128	1	15 03 21.81	2.0631	15 17 02.6	5.961
2	13 26 32.85	2.0631	9 19 52.4	9.074	2	15 05 25.61	2.0634	15 22 58.0	5.885
3	13 28 36.62	2.0626	9 28 55.2	9.019	3	15 07 29.42	2.0637	15 28 48.8	5.809
4	13 30 40.36	2.0621	9 37 54.7	8.964	4	15 09 33.25	2.0640	15 34 35.1	5.733
5	13 32 44.07	2.0617	9 46 50.9	8.908	5	15 11 37.10	2.0644	15 40 16.8	5.656
6	13 34 47.77	2.0614	9 55 43.7	8.851	6	15 13 40.98	2.0648	15 45 53.8	5.578
7	13 36 51.44	2.0610	10 04 33.0	8.793	7	15 15 44.88	2.0652	15 51 26.2	5.501
8	13 38 55.09	2.0607	10 13 18.8	8.735	8	15 17 48.80	2.0655	15 56 53.9	5.423
9	13 40 58.72	2.0603	10 22 01.2	8.677	9	15 19 52.74	2.0658	16 02 17.0	5.346
10	13 43 02.33	2.0601	10 30 40.1	8.618	10	15 21 56.70	2.0662	16 07 35.4	5.267
11	13 45 05.93	2.0598	10 39 15.4	8.558	11	15 24 00.69	2.0667	16 12 49.1	5.188
12	13 47 09.51	2.0596	10 47 47.1	8.498	12	15 26 04.70	2.0670	16 17 58.0	5.109
13	13 49 13.08	2.0594	10 56 15.2	8.438	13	15 28 08.73	2.0674	16 23 02.2	5.031
14	13 51 16.64	2.0592	11 04 39.7	8.377	14	15 30 12.79	2.0678	16 28 01.7	4.952
15	13 53 20.18	2.0590	11 13 00.5	8.316	15	15 32 16.87	2.0682	16 32 56.4	4.872
16	13 55 23.72	2.0589	11 21 17.6	8.253	16	15 34 20.98	2.0687	16 37 46.4	4.792
17	13 57 27.25	2.0587	11 29 30.9	8.191	17	15 36 25.11	2.0690	16 42 31.5	4.712
18	13 59 30.77	2.0586	11 37 40.5	8.128	18	15 38 29.26	2.0694	16 47 11.8	4.632
19	14 01 34.28	2.0585	11 45 46.3	8.064	19	15 40 33.44	2.0698	16 51 47.3	4.552
20	14 03 37.79	2.0584	11 53 48.2	8.000	20	15 42 37.64	2.0702	16 56 18.0	4.471
21	14 05 41.29	2.0583	12 01 46.3	7.936	21	15 44 41.87	2.0707	17 00 43.8	4.389
22	14 07 44.79	2.0583	12 09 40.5	7.871	22	15 46 46.12	2.0711	17 05 04.7	4.308
23	14 09 48.29	+ 2.0583	S. 12 17 30.8	− 7.806	23	15 48 50.40	+ 2.0715	S. 17 09 20.8	− 4.227
	SATURDAY 6.					**MONDAY 8.**			
0	14 11 51.79	+ 2.0583	S. 12 25 17.2	− 7.740	0	15 50 54.70	+ 2.0718	S. 17 13 31.9	− 4.145
1	14 13 55.29	2.0583	12 32 59.6	7.673	1	15 52 59.02	2.0722	17 17 38.2	4.063
2	14 15 58.79	2.0583	12 40 38.0	7.607	2	15 55 03.37	2.0727	17 21 39.5	3.981
3	14 18 02.29	2.0584	12 48 12.4	7.539	3	15 57 07.75	2.0732	17 25 35.9	3.898
4	14 20 05.80	2.0585	12 55 42.7	7.472	4	15 59 12.15	2.0735	17 29 27.3	3.816
5	14 22 09.31	2.0586	13 03 09.0	7.404	5	16 01 16.57	2.0738	17 33 13.8	3.733
6	14 24 12.83	2.0587	13 10 31.2	7.336	6	16 03 21.01	2.0742	17 36 55.3	3.650
7	14 26 16.36	2.0588	13 17 49.3	7.267	7	16 05 25.48	2.0747	17 40 31.8	3.567
8	14 28 19.89	2.0589	13 25 03.2	7.197	8	16 07 29.97	2.0751	17 44 03.4	3.484
9	14 30 23.43	2.0591	13 32 12.9	7.127	9	16 09 34.49	2.0755	17 47 29.9	3.400
10	14 32 26.98	2.0592	13 39 18.4	7.057	10	16 11 39.03	2.0758	17 50 51.4	3.317
11	14 34 30.54	2.0594	13 46 19.7	6.987	11	16 13 43.59	2.0762	17 54 07.9	3.232
12	14 36 34.11	2.0596	13 53 16.8	6.916	12	16 15 48.18	2.0767	17 57 19.3	3.148
13	14 38 37.69	2.0597	14 00 09.6	6.845	13	16 17 52.79	2.0770	18 00 25.7	3.064
14	14 40 41.28	2.0600	14 06 58.2	6.773	14	16 19 57.42	2.0774	18 03 27.0	2.980
15	14 42 44.89	2.0602	14 13 42.4	6.701	15	16 22 02.08	2.0777	18 06 23.3	2.896
16	14 44 48.51	2.0604	14 20 22.3	6.628	16	16 24 06.75	2.0781	18 09 14.5	2.811
17	14 46 52.14	2.0607	14 26 57.8	6.555	17	16 26 11.45	2.0785	18 12 00.6	2.726
18	14 48 55.79	2.0610	14 33 28.9	6.482	18	16 28 16.17	2.0788	18 14 41.6	2.641
19	14 50 59.46	2.0612	14 39 55.7	6.409	19	16 30 20.91	2.0792	18 17 17.5	2.556
20	14 53 03.14	2.0615	14 46 18.0	6.335	20	16 32 25.67	2.0795	18 19 48.3	2.471
21	14 55 06.84	2.0618	14 52 35.9	6.261	21	16 34 30.45	2.0798	18 22 14.0	2.386
22	14 57 10.56	2.0621	14 58 49.3	6.187	22	16 36 35.25	2.0802	18 24 34.6	2.300
23	14 59 14.29	2.0623	15 04 58.3	6.112	23	16 38 40.07	2.0805	18 26 50.0	2.214
24	15 01 18.04	+ 2.0627	S. 15 11 02.7	− 6.036	24	16 40 44.91	+ 2.0808	S. 18 29 00.3	− 2.128

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
			TUESDAY 9.					**THURSDAY 11.**	
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 40 44.91	+ 2.0808	S.18 29 00.3	− 2.128	0	18 20 49.17	+ 2.0850	S.18 31 11.5	+ 2.042
1	16 42 49.77	2.0812	18 31 05.4	2.042	1	18 22 54.27	2.0848	18 29 06.4	2.127
2	16 44 54.65	2.0814	18 33 05.4	1.957	2	18 24 59.35	2.0847	18 26 56.2	2.213
3	16 46 59.54	2.0817	18 35 00.2	1.871	3	18 27 04.43	2.0846	18 24 40.8	2.300
4	16 49 04.45	2.0820	18 36 49.9	1.785	4	18 29 09.50	2.0843	18 22 20.2	2.386
5	16 51 09.38	2.0823	18 38 34.4	1.698	5	18 31 14.55	2.0841	18 19 54.5	2.472
6	16 53 14.33	2.0826	18 40 13.7	1.612	6	18 33 19.59	2.0839	18 17 23.6	2.557
7	16 55 19.29	2.0827	18 41 47.8	1.525	7	18 35 24.62	2.0837	18 14 47.6	2.642
8	16 57 24.26	2.0830	18 43 16.7	1.439	8	18 37 29.64	2.0835	18 12 06.5	2.727
9	16 59 29.25	2.0833	18 44 40.5	1.353	9	18 39 34.64	2.0832	18 09 20.3	2.813
10	17 01 34.26	2.0836	18 45 59.1	1.266	10	18 41 39.63	2.0831	18 06 28.9	2.898
11	17 03 39.28	2.0837	18 47 12.4	1.178	11	18 43 44.61	2.0828	18 03 32.5	2.983
12	17 05 44.30	2.0838	18 48 20.5	1.092	12	18 45 49.57	2.0826	18 00 30.9	3.068
13	17 07 49.34	2.0842	18 49 23.4	1.005	13	18 47 54.52	2.0823	17 57 24.3	3.152
14	17 09 54.40	2.0844	18 50 21.1	0.918	14	18 49 59.45	2.0820	17 54 12.6	3.237
15	17 11 59.47	2.0846	18 51 13.6	0.832	15	18 52 04.36	2.0817	17 50 55.8	3.322
16	17 14 04.55	2.0847	18 52 00.9	0.744	16	18 54 09.26	2.0815	17 47 33.9	3.407
17	17 16 09.63	2.0848	18 52 42.9	0.657	17	18 56 14.14	2.0812	17 44 07.0	3.490
18	17 18 14.73	2.0851	18 53 19.7	0.570	18	18 58 19.00	2.0809	17 40 35.1	3.573
19	17 20 19.84	2.0852	18 53 51.3	0.483	19	19 00 23.85	2.0807	17 36 58.2	3.657
20	17 22 24.96	2.0853	18 54 17.7	0.396	20	19 02 28.68	2.0803	17 33 16.2	3.742
21	17 24 30 08	2.0854	18 54 38.8	0.308	21	19 04 33.49	2.0800	17 29 29.2	3.824
22	17 26 35.21	2.0856	18 54 54.7	0.221	22	19 06 38.28	2.0797	17 25 37.3	3.907
23	17 28 40.35	+ 2.0857	S.18 55 05.3	− 0.134	23	19 08 43.05	+ 2.0794	S.17 21 40.4	+ 3.991
			WEDNESDAY 10.					**FRIDAY 12.**	
0	17 30 45.50	+ 2.0858	S.18 55 10.8	− 0.047	0	19 10 47.81	+ 2.0792	S.17 17 38.4	+ 4.074
1	17 32 50.65	2.0859	18 55 11.0	+ 0.041	1	19 12 52.55	2.0788	17 13 31.5	4.156
2	17 34 55.81	2.0860	18 55 05.9	0.128	2	19 14 57.26	2.0784	17 09 19.7	4.237
3	17 37 00.97	2.0860	18 54 55.6	0.216	3	19 17 01.96	2.0782	17 05 03.0	4.319
4	17 39 06.13	2.0860	18 54 40.0	0.303	4	19 19 06.64	2.0778	17 00 41.4	4.401
5	17 41 11.29	2.0861	18 54 19.2	0.390	5	19 21 11.29	2.0774	16 56 14.9	4.482
6	17 43 16.46	2.0862	18 53 53.2	0.477	6	19 23 15.93	2.0772	16 51 43.5	4.564
7	17 45 21.63	2.0862	18 53 22.0	0.564	7	19 25 20.55	2.0768	16 47 07.2	4.645
8	17 47 26.80	2.0862	18 52 45.5	0.652	8	19 27 25.14	2.0764	16 42 26.1	4.726
9	17 49 31.97	2.0862	18 52 03.8	0.739	9	19 29 29.72	2.0761	16 37 40.1	4.807
10	17 51 37.14	2.0862	18 51 16.8	0.827	10	19 31 34.27	2.0757	16 32 49.3	4.887
11	17 53 42.31	2.0862	18 50 24.6	0.913	11	19 33 38.80	2.0754	16 27 53.7	4.967
12	17 55 47.48	2.0862	18 49 27.2	1.000	12	19 35 43.32	2.0751	16 22 53.3	5.047
13	17 57 52.65	2.0861	18 48 24.6	1.087	13	19 37 47.81	2.0747	16 17 48.1	5.126
14	17 59 57.81	2.0860	18 47 16.7	1.175	14	19 39 52.28	2.0743	16 12 38.2	5.205
15	18 02 02.97	2.0860	18 46 03.6	1.262	15	19 41 56.73	2.0740	16 07 23.5	5.284
16	18 04 08.13	2.0859	18 44 45.3	1.348	16	19 44 01.16	2.0737	16 02 04.1	5.362
17	18 06 13.28	2.0858	18 43 21.8	1.435	17	19 46 05.57	2.0733	15 56 40.0	5.441
18	18 08 18.43	2.0857	18 41 53.1	1.522	18	19 48 09.96	2.0729	15 51 11.2	5.519
19	18 10 23.57	2.0857	18 40 19.2	1.609	19	19 50 14.32	2.0726	15 45 37.7	5.597
20	18 12 28.71	2.0856	18 38 40.0	1.696	20	19 52 18.67	2.0723	15 39 59.6	5.675
21	18 14 33.84	2.0854	18 36 55.7	1.782	21	19 54 23.00	2.0720	15 34 16.9	5.751
22	18 16 38.96	2.0852	18 35 06.1	1.869	22	19 56 27.31	2.0717	15 28 29.5	5.828
23	18 18 44.07	2.0851	18 33 11.4	1.955	23	19 58 31.60	2.0712	15 22 37.5	5.904
24	18 20 49.17	+ 2.0850	S.18 31 11.5	+ 2.042	24	20 00 35.86	+ 2.0709	S.15 16 41.0	+ 5.980

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 13.					**MONDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 00 35.86	+2.0709	S.15 16 41.0	+5.980	0	21 39 46.75	+2.0665	S. 9 09 43.6	+9.125
1	20 02 40.11	2.0707	15 10 39.9	6.056	1	21 41 50.75	2.0668	9 00 34.5	9.177
2	20 04 44.34	2.0703	15 04 34.3	6.132	2	21 43 54.77	2.0672	8 51 22.3	9.229
3	20 06 48.54	2.0699	14 58 24.1	6.207	3	21 45 58.82	2.0676	8 42 07.0	9.280
4	20 08 52.73	2.0697	14 52 09.5	6.281	4	21 48 02.88	2.0679	8 32 48.7	9.331
5	20 10 56.90	2.0693	14 45 50.4	6.355	5	21 50 06.97	2.0683	8 23 27.3	9.381
6	20 13 01.05	2.0691	14 39 26.9	6.429	6	21 52 11.08	2.0687	8 14 03.0	9.429
7	20 15 05.19	2.0688	14 32 58.9	6.503	7	21 54 15.22	2.0692	8 04 35.8	9.478
8	20 17 09.31	2.0685	14 26 26.5	6.576	8	21 56 19.39	2.0697	7 55 05.6	9.527
9	20 19 13.41	2.0682	14 19 49.8	6.649	9	21 58 23.58	2.0702	7 45 32.6	9.574
10	20 21 17.49	2.0679	14 13 08.6	6.722	10	22 00 27.81	2.0707	7 35 56.7	9.621
11	20 23 21.56	2.0677	14 06 23.2	6.793	11	22 02 32.06	2.0712	7 26 18.1	9.666
12	20 25 25.61	2.0674	13 59 33.5	6.864	12	22 04 36.35	2.0717	7 16 36.8	9.711
13	20 27 29.65	2.0672	13 52 39.5	6.936	13	22 06 40.67	2.0723	7 06 52.8	9.756
14	20 29 33.67	2.0668	13 45 41.2	7.007	14	22 08 45.03	2.0730	6 57 06.1	9.800
15	20 31 37.67	2.0666	13 38 38.6	7.078	15	22 10 49.43	2.0736	6 47 16.8	9.842
16	20 33 41.66	2.0664	13 31 31.8	7.147	16	22 12 53.86	2.0742	6 37 25.0	9.884
17	20 35 45.64	2.0662	13 24 20.9	7.217	17	22 14 58.34	2.0750	6 27 30.7	9.926
18	20 37 49.61	2.0661	13 17 05.8	7.286	18	22 17 02.86	2.0757	6 17 33.9	9.967
19	20 39 53.57	2.0658	13 09 46.6	7.355	19	22 19 07.43	2.0765	6 07 34.6	10.007
20	20 41 57.51	2.0656	13 02 23.2	7.423	20	22 21 12.04	2.0772	5 57 33.0	10.046
21	20 44 01.44	2.0654	12 54 55.8	7.491	21	22 23 16.70	2.0780	5 47 29.1	10.084
22	20 46 05.36	2.0653	12 47 24.3	7.558	22	22 25 21.40	2.0788	5 37 22.9	10.122
23	20 48 09.28	+2.0652	S.12 39 48.8	+7.624	23	22 27 26.16	+2.0797	S. 5 27 14.4	+10.159
	SUNDAY 14.					**TUESDAY 16.**			
0	20 50 13.18	+2.0650	S.12 32 09.4	+7.690	0	22 29 30.97	+2.0806	S. 5 17 03.8	+10.195
1	20 52 17.08	2.0649	12 24 26.0	7.757	1	22 31 35.83	2.0815	5 06 51.0	10.231
2	20 54 20.97	2.0647	12 16 38.6	7.822	2	22 33 40.75	2.0825	4 56 36.1	10.265
3	20 56 24.85	2.0647	12 08 47.3	7.887	3	22 35 45.73	2.0835	4 46 19.2	10.298
4	20 58 28.73	2.0647	12 00 52.1	7.952	4	22 37 50.77	2.0845	4 36 00.3	10.332
5	21 00 32.61	2.0646	11 52 53.1	8.015	5	22 39 55.87	2.0855	4 25 39.4	10.364
6	21 02 36.48	2.0645	11 44 50.3	8.078	6	22 42 01.03	2.0866	4 15 16.6	10.395
7	21 04 40.35	2.0645	11 36 43.7	8.142	7	22 44 06.26	2.0877	4 04 52.0	10.425
8	21 06 44.22	2.0645	11 28 33.3	8.204	8	22 46 11.56	2.0888	3 54 25.6	10.455
9	21 08 48.09	2.0645	11 20 19.2	8.266	9	22 48 16.92	2.0900	3 43 57.4	10.484
10	21 10 51.96	2.0645	11 12 01.4	8.327	10	22 50 22.36	2.0912	3 33 27.5	10.512
11	21 12 55.83	2.0645	11 03 39.9	8.387	11	22 52 27.86	2.0923	3 22 55.9	10.539
12	21 14 59.70	2.0646	10 55 14.9	8.447	12	22 54 33.44	2.0937	3 12 22.8	10.565
13	21 17 03.58	2.0647	10 46 46.2	8.507	13	22 56 39.10	2.0949	3 01 48.1	10.591
14	21 19 07.46	2.0647	10 38 14.0	8.566	14	22 58 44.83	2.0962	2 51 11.9	10.615
15	21 21 11.35	2.0648	10 29 38.3	8.624	15	23 00 50.64	2.0976	2 40 34.3	10.638
16	21 23 15.24	2.0649	10 20 59.1	8.682	16	23 02 56.54	2.0990	2 29 55.3	10.661
17	21 25 19.14	2.0651	10 12 16.4	8.740	17	23 05 02.52	2.1004	2 19 15.0	10.683
18	21 27 23.05	2.0652	10 03 30.3	8.797	18	23 07 08.59	2.1018	2 08 33.3	10.705
19	21 29 26.97	2.0654	9 54 40.8	8.853	19	23 09 14.74	2.1032	1 57 50.4	10.724
20	21 31 30.90	2.0656	9 45 47.9	8.909	20	23 11 20.98	2.1047	1 47 06.4	10.743
21	21 33 34.84	2.0658	9 36 51.7	8.964	21	23 13 27.31	2.1063	1 36 21.2	10.762
22	21 35 38.80	2.0661	9 27 52.2	9.018	22	23 15 33.74	2.1079	1 25 35.0	10.778
23	21 37 42.77	2.0662	9 18 49.5	9.072	23	23 17 40.26	2.1094	1 14 47.8	10.794
24	21 39 46.75	+2.0665	S. 9 09 43.6	+9.125	24	23 19 46.87	+2.1110	S. 1 03 59.7	+10.810

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 17.					FRIDAY 19.				

WEDNESDAY 17. / FRIDAY 19.

Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ′ ″)	Diff. for 1 Minute. (″)	Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ′ ″)	Diff. for 1 Minute. (″)
0	23 19 46.87	+ 2.1110	S. 1 03 59.7	+ 10.810	0	1 03 35.88	+ 2.2262	N. 7 33 19.1	+ 10.332
1	23 21 53.58	2.1127	0 53 10.6	10.825	1	1 05 49.54	2.2292	7 43 37.9	10.294
2	23 24 00.40	2.1145	0 42 20.7	10.838	2	1 08 03.38	2.2322	7 53 54.4	10.256
3	23 26 07.32	2.1162	0 31 30.0	10.851	3	1 10 17.41	2.2354	8 04 08.6	10.217
4	23 28 14.34	2.1179	0 20 38.6	10.862	4	1 12 31.63	2.2386	8 14 20.4	10.176
5	23 30 21.47	2.1197	S. 0 09 46.6	10.872	5	1 14 46.04	2.2417	8 24 29.7	10.134
6	23 32 28.71	2.1216	N. 0 01 06.1	10.882	6	1 17 00.63	2.2448	8 34 36.5	10.092
7	23 34 36.06	2.1234	0 11 59.3	10.891	7	1 19 15.42	2.2481	8 44 40.7	10.047
8	23 36 43.52	2.1253	0 22 53.0	10.899	8	1 21 30.40	2.2513	8 54 42.2	10.002
9	23 38 51.10	2.1272	0 33 47.2	10.906	9	1 23 45.58	2.2546	9 04 40.9	9.955
10	23 40 58.79	2.1292	0 44 41.7	10.911	10	1 26 00.95	2.2577	9 14 36.8	9.908
11	23 43 06.60	2.1312	0 55 36.5	10.915	11	1 28 16.51	2.2610	9 24 29.9	9.860
12	23 45 14.53	2.1332	1 06 31.5	10.918	12	1 30 32.27	2.2643	9 34 20.0	9.810
13	23 47 22.58	2.1352	1 17 26.7	10.922	13	1 32 48.23	2.2676	9 44 07.1	9.758
14	23 49 30.76	2.1373	1 28 22.1	10.923	14	1 35 04.38	2.2708	9 53 51.0	9.706
15	23 51 39.06	2.1394	1 39 17.5	10.923	15	1 37 20.73	2.2742	10 03 31.8	9.653
16	23 53 47.49	2.1416	1 50 12.9	10.922	16	1 39 37.28	2.2775	10 13 09.4	9.598
17	23 55 56.05	2.1438	2 01 08.2	10.921	17	1 41 54.03	2.2808	10 22 43.6	9.542
18	23 58 04.75	2.1461	2 12 03.4	10.918	18	1 44 10.98	2.2842	10 32 14.5	9.486
19	0 00 13.58	2.1482	2 22 58.4	10.914	19	1 46 28.13	2.2875	10 41 41.9	9.428
20	0 02 22.54	2.1505	2 33 53.1	10.910	20	1 48 45.48	2.2909	10 51 05.8	9.369
21	0 04 31.64	2.1528	2 44 47.6	10.905	21	1 51 03.04	2.2943	11 00 26.2	9.309
22	0 06 40.88	2.1552	2 55 41.7	10.897	22	1 53 20.80	2.2977	11 09 42.9	9.247
23	0 08 50.26	+ 2.1576	N. 3 06 35.3	+ 10.889	23	1 55 38.76	+ 2.3010	N.11 18 55.8	+ 9.183

THURSDAY 18. / SATURDAY 20.

Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ′ ″)	Diff. for 1 Minute. (″)	Hour.	Right Ascension. (h m s)	Diff. for 1 Minute. (s)	Declination. (° ′ ″)	Diff. for 1 Minute. (″)
0	0 10 59.79	+ 2.1600	N. 3 17 28.4	+ 10.880	0	1 57 56.92	+ 2.3043	N.11 28 04.9	+ 9.120
1	0 13 09.46	2.1624	3 28 20.9	10.870	1	2 00 15.28	2.3077	11 37 10.2	9.056
2	0 15 19.28	2.1648	3 39 12.8	10.859	2	2 02 33.85	2.3112	11 46 11.6	8.989
3	0 17 29.24	2.1672	3 50 04.0	10.847	3	2 04 52.62	2.3146	11 55 08.9	8.922
4	0 19 39.35	2.1698	4 00 54.4	10.833	4	2 07 11.60	2.3180	12 04 02.2	8.854
5	0 21 49.62	2.1724	4 11 44.0	10.819	5	2 09 30.78	2.3213	12 12 51.4	8.784
6	0 24 00.04	2.1750	4 22 32.7	10.804	6	2 11 50.16	2.3247	12 21 36.3	8.713
7	0 26 10.62	2.1777	4 33 20.5	10.787	7	2 14 09.74	2.3281	12 30 17.0	8.642
8	0 28 21.36	2.1802	4 44 07.2	10.769	8	2 16 29.53	2.3315	12 38 53.4	8.570
9	0 30 32.25	2.1828	4 54 52.8	10.751	9	2 18 49.52	2.3348	12 47 25.4	8.496
10	0 32 43.30	2.1856	5 05 37.3	10.731	10	2 21 09.71	2.3382	12 55 52.9	8.421
11	0 34 54.52	2.1883	5 16 20.5	10.709	11	2 23 30.11	2.3417	13 04 15.9	8.345
12	0 37 05.90	2.1911	5 27 02.4	10.687	12	2 25 50.71	2.3450	13 12 34.3	8.267
13	0 39 17.45	2.1938	5 37 43.0	10.664	13	2 28 11.51	2.3484	13 20 48.0	8.189
14	0 41 29.16	2.1967	5 48 22.1	10.639	14	2 30 32.52	2.3517	13 28 57.0	8.110
15	0 43 41.05	2.1995	5 58 59.7	10.613	15	2 32 53.72	2.3550	13 37 01.2	8.030
16	0 45 53.10	2.2023	6 09 35.7	10.587	16	2 35 15.12	2.3584	13 45 00.6	7.948
17	0 48 05.33	2.2052	6 20 10.1	10.559	17	2 37 36.73	2.3617	13 52 55.0	7.865
18	0 50 17.73	2.2082	6 30 42.8	10.530	18	2 39 58.53	2.3650	14 00 44.4	7.782
19	0 52 30.31	2.2112	6 41 13.7	10.499	19	2 42 20.53	2.3682	14 08 28.8	7.697
20	0 54 43.07	2.2141	6 51 42.7	10.467	20	2 44 42.72	2.3715	14 16 08.0	7.611
21	0 56 56.00	2.2170	7 02 09.8	10.436	21	2 47 05.11	2.3748	14 23 42.1	7.525
22	0 59 09.11	2.2200	7 12 35.0	10.402	22	2 49 27.70	2.3781	14 31 11.0	7.437
23	1 01 22.40	2.2231	7 22 58.1	10.367	23	2 51 50.48	2.3812	14 38 34.6	7.348
24	1 03 35.88	+ 2.2262	N. 7 33 19.1	+ 10.332	24	2 54 13.44	+ 2.3843	N.14 45 52.8	+ 7.259

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
			SUNDAY 21.					TUESDAY 23.	
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 54 13.44	+ 2.3843	N.14 45 52.8	+ 7.259	0	4 51 41.32	+ 2.4913	N.18 34 34.5	+ 2.007
1	2 56 36.60	2.3876	14 53 05.6	7.167	1	4 54 10.83	2.4922	18 36 31.2	1.884
2	2 58 59.95	2.3907	15 00 12.9	7.076	2	4 56 40.39	2.4930	18 38 20.6	1.761
3	3 01 23.49	2.3939	15 07 14.7	6.983	3	4 59 09.99	2.4937	18 40 02.5	1.637
4	3 03 47.22	2.3970	15 14 10.9	6.889	4	5 01 39.64	2.4944	18 41 37.0	1.513
5	3 06 11.13	2.4001	15 21 01.4	6.795	5	5 04 09.32	2.4950	18 43 04.1	1.390
6	3 08 35.23	2.4031	15 27 46.3	6.700	6	5 06 39.04	2.4956	18 44 23.8	1.266
7	3 10 59.50	2.4061	15 34 25.4	6.602	7	5 09 08.79	2.4960	18 45 36.0	1.142
8	3 13 23.96	2.4092	15 40 58.6	6.505	8	5 11 38.56	2.4963	18 46 40.8	1.017
9	3 15 48.60	2.4121	15 47 26.0	6.407	9	5 14 08.35	2.4967	18 47 38.1	0.892
10	3 18 13.41	2.4149	15 53 47.5	6.308	10	5 16 38.16	2.4969	18 48 27.9	0.767
11	3 20 38.39	2.4178	16 00 03.0	6.207	11	5 19 07.98	2.4970	18 49 10.2	0.642
12	3 23 03.55	2.4207	16 06 12.4	6.107	12	5 21 37.80	2.4971	18 49 45.0	0.518
13	3 25 28.88	2.4236	16 12 15.8	6.005	13	5 24 07.63	2.4972	18 50 12.4	0.394
14	3 27 54.38	2.4263	16 18 13.0	5.902	14	5 26 37.46	2.4972	18 50 32.3	0.269
15	3 30 20.04	2.4290	16 24 04.0	5.798	15	5 29 07.29	2.4971	18 50 44.7	0.144
16	3 32 45.86	2.4317	16 29 48.8	5.694	16	5 31 37.11	2.4968	18 50 49.6	+ 0.019
17	3 35 11.85	2.4345	16 35 27.3	5.589	17	5 34 06.91	2.4966	18 50 47.0	− 0.105
18	3 37 38.00	2.4371	16 40 59.5	5.483	18	5 36 36.70	2.4963	18 50 37.0	0.230
19	3 40 04.30	2.4396	16 46 25.3	5.376	19	5 39 06.47	2.4959	18 50 19.4	0.355
20	3 42 30.75	2.4422	16 51 44.6	5.268	20	5 41 36.21	2.4954	18 49 54.4	0.479
21	3 44 57.36	2.4447	16 56 57.5	5.161	21	5 44 05.92	2.4948	18 49 21.9	0.603
22	3 47 24.11	2.4471	17 02 03.9	5.052	22	5 46 35.59	2.4942	18 48 42.0	0.727
23	3 49 51.01	+ 2.4495	N.17 07 03.7	+ 4.942	23	5 49 05.23	+ 2.4936	N.18 47 54.6	− 0.852
			MONDAY 22.					WEDNESDAY 24.	
0	3 52 18.05	+ 2.4518	N.17 11 56.9	+ 4.831	0	5 51 34.82	+ 2.4928	N.18 46 59.7	− 0.977
1	3 54 45.23	2.4541	17 16 43.4	4.720	1	5 54 04.36	2.4920	18 45 57.4	1.100
2	3 57 12.54	2.4563	17 21 23.3	4.608	2	5 56 33.86	2.4912	18 44 47.7	1.223
3	3 59 39.99	2.4586	17 25 56.4	4.495	3	5 59 03.30	2.4902	18 43 30.6	1.347
4	4 02 07.57	2.4607	17 30 22.7	4.382	4	6 01 32.68	2.4892	18 42 06.1	1.470
5	4 04 35.28	2.4628	17 34 42.2	4.268	5	6 04 02.00	2.4882	18 40 34.2	1.592
6	4 07 03.11	2.4648	17 38 54.9	4.154	6	6 06 31.26	2.4870	18 38 55.0	1.715
7	4 09 31.06	2.4668	17 43 00.7	4.038	7	6 09 00.44	2.4857	18 37 08.4	1.837
8	4 11 59.13	2.4687	17 46 59.5	3.922	8	6 11 29.55	2.4845	18 35 14.5	1.959
9	4 14 27.31	2.4707	17 50 51.4	3.807	9	6 13 58.58	2.4832	18 33 13.3	2.081
10	4 16 55.61	2.4725	17 54 36.3	3.690	10	6 16 27.53	2.4817	18 31 04.8	2.202
11	4 19 24.01	2.4742	17 58 14.2	3.572	11	6 18 56.39	2.4802	18 28 49.1	2.322
12	4 21 52.52	2.4760	18 01 45.0	3.454	12	6 21 25.16	2.4787	18 26 26.1	2.443
13	4 24 21.13	2.4776	18 05 08.7	3.336	13	6 23 53.84	2.4772	18 23 55.9	2.564
14	4 26 49.83	2.4792	18 08 25.3	3.217	14	6 26 22.42	2.4755	18 21 18.4	2.684
15	4 29 18.63	2.4807	18 11 34.8	3.098	15	6 28 50.90	2.4737	18 18 33.8	2.802
16	4 31 47.51	2.4821	18 14 37.1	2.978	16	6 31 19.27	2.4720	18 15 42.1	2.921
17	4 34 16.48	2.4835	18 17 32.2	2.858	17	6 33 47.54	2.4702	18 12 43.3	3.039
18	4 36 45.53	2.4848	18 20 20.1	2.737	18	6 36 15.69	2.4682	18 09 37.4	3.157
19	4 39 14.66	2.4861	18 23 00.7	2.617	19	6 38 43.73	2.4663	18 06 24.4	3.275
20	4 41 43.86	2.4872	18 25 34.1	2.496	20	6 41 11.65	2.4643	18 03 04.4	3.392
21	4 44 13.13	2.4884	18 28 00.2	2.374	21	6 43 39.45	2.4623	17 59 37.4	3.507
22	4 46 42.47	2.4895	18 30 19.0	2.252	22	6 46 07.13	2.4602	17 56 03.5	3.622
23	4 49 11.87	2.4904	18 32 30.4	2.129	23	6 48 34.67	2.4580	17 52 22.7	3.738
24	4 51 41.32	+ 2.4913	N.18 34 34.5	+ 2.007	24	6 51 02.09	+ 2.4558	N.17 48 34.9	− 3.853

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 25.					**SATURDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 51 02.09	+ 2.4558	N.17 48 34.9	− 3.853	0	8 45 38.48	+ 2.3103	N.12 46 05.9	− 8.411
1	6 53 29.37	2.4536	17 44 40.3	3.967	1	8 47 57.00	2.3069	12 37 39.1	8.482
2	6 55 56.52	2.4512	17 40 38.9	4.079	2	8 50 15.31	2.3035	12 29 08.0	8.553
3	6 58 23.52	2.4488	17 36 30.8	4.192	3	8 52 33.42	2.3002	12 20 32.7	8.622
4	7 00 50.38	2.4465	17 32 15.9	4.304	4	8 54 51.33	2.2968	12 11 53.3	8.691
5	7 03 17.10	2.4441	17 27 54.3	4.416	5	8 57 09.04	2.2934	12 03 09.8	8.759
6	7 05 43.67	2.4415	17 23 26.0	4.527	6	8 59 26.54	2.2900	11 54 22.2	8.826
7	7 08 10.08	2.4389	17 18 51.1	4.636	7	9 01 43.84	2.2867	11 45 30.7	8.890
8	7 10 36.34	2.4363	17 14 09.7	4.745	8	9 04 00.94	2.2834	11 36 35.4	8.954
9	7 13 02.44	2.4337	17 09 21.7	4.854	9	9 06 17.85	2.2801	11 27 36.2	9.018
10	7 15 28.39	2.4311	17 04 27.2	4.962	10	9 08 34.55	2.2767	11 18 33.2	9.080
11	7 17 54.17	2.4283	16 59 26.3	5.068	11	9 10 51.05	2.2733	11 09 26.6	9.141
12	7 20 19.78	2.4255	16 54 19.0	5.174	12	9 13 07.35	2.2701	11 00 16.3	9.201
13	7 22 45.23	2.4227	16 49 05.4	5.280	13	9 15 23.46	2.2668	10 51 02.5	9.259
14	7 25 10.51	2.4199	16 43 45.4	5.385	14	9 17 39.37	2.2635	10 41 45.2	9.317
15	7 27 35.62	2.4171	16 38 19.2	5.489	15	9 19 55.08	2.2602	10 32 24.5	9.373
16	7 30 00.56	2.4142	16 32 46.7	5.592	16	9 22 10.60	2.2571	10 23 00.4	9.429
17	7 32 25.33	2.4113	16 27 08.1	5.695	17	9 24 25.93	2.2538	10 13 33.0	9.483
18	7 34 49.92	2.4083	16 21 23.3	5.797	18	9 26 41.06	2.2506	10 04 02.4	9.537
19	7 37 14.33	2.4053	16 15 32.5	5.897	19	9 28 56.00	2.2474	9 54 28.6	9.589
20	7 39 38.56	2.4022	16 09 35.7	5.997	20	9 31 10.75	2.2442	9 44 51.7	9.640
21	7 42 02.60	2.3992	16 03 32.9	6.096	21	9 33 25.31	2.2411	9 35 11.8	9.690
22	7 44 26.46	2.3962	15 57 24.2	6.194	22	9 35 39.68	2.2379	9 25 28.9	9.739
23	7 46 50.14	+ 2.3931	N.15 51 09.6	− 6.291	23	9 37 53.86	+ 2.2347	N. 9 15 43.1	− 9.787
	FRIDAY 26.					**SUNDAY 28.**			
0	7 49 13.63	+ 2.3899	N.15 44 49.3	− 6.387	0	9 40 07.85	+ 2.2317	N. 9 05 54.4	− 9.834
1	7 51 36.93	2.3867	15 38 23.2	6.482	1	9 42 21.66	2.2287	8 56 03.0	9.879
2	7 54 00.04	2.3836	15 31 51.4	6.577	2	9 44 35.29	2.2257	8 46 08.9	9.924
3	7 56 22.96	2.3804	15 25 13.9	6.671	3	9 46 48.74	2.2226	8 36 12.1	9.967
4	7 58 45.69	2.3772	15 18 30.9	6.763	4	9 49 02.00	2.2195	8 26 12.8	10.009
5	8 01 08.22	2.3739	15 11 42.3	6.855	5	9 51 15.08	2.2166	8 16 11.0	10.050
6	8 03 30.56	2.3707	15 04 48.3	6.946	6	9 53 27.99	2.2137	8 06 06.8	10.091
7	8 05 52.70	2.3674	14 57 48.8	7.037	7	9 55 40.72	2.2107	7 56 00.1	10.131
8	8 08 14.65	2.3642	14 50 43.9	7.125	8	9 57 53.28	2.2078	7 45 51.1	10.168
9	8 10 36.40	2.3608	14 43 33.8	7.212	9	10 00 05.66	2.2049	7 35 39.9	10.205
10	8 12 57.95	2.3575	14 36 18.4	7.300	10	10 02 17.87	2.2021	7 25 26.5	10.241
11	8 15 19.30	2.3541	14 28 57.8	7.385	11	10 04 29.91	2.1992	7 15 11.0	10.275
12	8 17 40.44	2.3507	14 21 32.2	7.470	12	10 06 41.77	2.1963	7 04 53.5	10.308
13	8 20 01.39	2.3475	14 14 01.4	7.555	13	10 08 53.47	2.1937	6 54 34.0	10.341
14	8 22 22.14	2.3442	14 06 25.6	7.637	14	10 11 05.01	2.1909	6 44 12.6	10.372
15	8 24 42.69	2.3407	13 58 44.9	7.719	15	10 13 16.38	2.1882	6 33 49.3	10.403
16	8 27 03.03	2.3373	13 50 59.3	7.800	16	10 15 27.59	2.1855	6 23 24.2	10.432
17	8 29 23.17	2.3340	13 43 08.9	7.880	17	10 17 38.64	2.1828	6 12 57.4	10.461
18	8 31 43.11	2.3307	13 35 13.7	7.959	18	10 19 49.53	2.1802	6 02 28.9	10.488
19	8 34 02.85	2.3272	13 27 13.8	8.037	19	10 22 00.26	2.1776	5 51 58.8	10.514
20	8 36 22.38	2.3238	13 19 09.2	8.114	20	10 24 10.84	2.1750	5 41 27.2	10.539
21	8 38 41.71	2.3205	13 11 00.1	8.189	21	10 26 21.26	2.1724	5 30 54.1	10.563
22	8 41 00.84	2.3171	13 02 46.5	8.264	22	10 28 31.53	2.1699	5 20 19.6	10.586
23	8 43 19.76	2.3137	12 54 28.4	8.338	23	10 30 41.65	2.1674	5 09 43.8	10.607
24	8 45 38.48	+ 2.3103	N.12 46 05.9	− 8.411	24	10 32 51.62	+ 2.1649	N. 4 59 06.8	− 10.627

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 29.					**WEDNESDAY, OCTOBER 1.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 32 51.62	+ 2.1649	N. 4 59 06.8	− 10.627	0	12 14 33.79	+ 2.0851	S. 3 35 26.2	− 10.438
1	10 35 01.44	2.1625	4 48 28.5	10.647					
2	10 37 11.12	2.1602	4 37 49.1	10.666					
3	10 39 20.66	2.1578	4 27 08.6	10.683					
4	10 41 30.06	2.1555	4 16 27.1	10.700					
5	10 43 39.32	2.1532	4 05 44.6	10.716					
6	10 45 48.44	2.1509	3 55 01.2	10.730					
7	10 47 57.43	2.1487	3 44 17.0	10.742					
8	10 50 06.28	2.1464	3 33 32.1	10.755					
9	10 52 15.00	2.1442	3 22 46.4	10.767					
10	10 54 23.59	2.1421	3 12 00.1	10.777					
11	10 56 32.05	2.1400	3 01 13.2	10.787					
12	10 58 40.39	2.1380	2 50 25.7	10.795					
13	11 00 48.61	2.1359	2 39 37.8	10.802					
14	11 02 56.70	2.1338	2 28 49.5	10.807					
15	11 05 04.67	2.1319	2 18 00.9	10.812					
16	11 07 12.53	2.1300	2 07 12.0	10.817					
17	11 09 20.27	2.1281	1 56 22.9	10.819					
18	11 11 27.90	2.1262	1 45 33.7	10.822					
19	11 13 35.42	2.1244	1 34 44.3	10.823		**PHASES OF THE MOON.**			
20	11 15 42.83	2.1226	1 23 54.9	10.822					
21	11 17 50.13	2.1207	1 13 05.6	10.822					
22	11 19 57.32	2.1190	1 02 16.3	10.820					
23	11 22 04.41	+ 2.1173	N. 0 51 27.2	− 10.817					
	TUESDAY 30.								
0	11 24 11.40	+ 2.1157	N. 0 40 38.3	− 10.813		● New Moon . . . . Sept.		1 17 19.4	
1	11 26 18.29	2.1140	0 29 49.6	10.808		☽ First Quarter		9 10 14.9	
2	11 28 25.08	2.1124	0 19 01.3	10.802		○ Full Moon		17 06 23.4	
3	11 30 31.78	2.1109	N. 0 08 13.3	10.796		☾ Last Quarter		24 04 31.5	
4	11 32 38.39	2.1093	S. 0 02 34.2	10.787					
5	11 34 44.90	2.1077	0 13 21.2	10.778				d h	
6	11 36 51.32	2.1063	0 24 07.6	10.769		☾ Apogee . . . . . . Sept.		9 22.6	
7	11 38 57.66	2.1049	0 34 53.5	10.759		☾ Perigee		23 00.8	
8	11 41 03.91	2.1034	0 45 38.7	10.747					
9	11 43 10.07	2.1020	0 56 23.2	10.735					
10	11 45 16.15	2.1007	1 07 06.9	10.721					
11	11 47 22.15	2.0994	1 17 49.7	10.707					
12	11 49 28.08	2.0982	1 28 31.7	10.692					
13	11 51 33.93	2.0969	1 39 12.7	10.675					
14	11 53 39.71	2.0957	1 49 52.7	10.658					
15	11 55 45.41	2.0945	2 00 31.7	10.640					
16	11 57 51.05	2.0933	2 11 09.5	10.621					
17	11 59 56.61	2.0922	2 21 46.2	10.602					
18	12 02 02.11	2.0911	2 32 21.7	10.581					
19	12 04 07.54	2.0900	2 42 55.9	10.559					
20	12 06 12.91	2.0890	2 53 28.8	10.537					
21	12 08 18.22	2.0880	3 04 00.4	10.514					
22	12 10 23.47	2.0870	3 14 30.5	10.489					
23	12 12 28.66	2.0860	3 24 59.1	10.464					
24	12 14 33.79	+ 2.0851	S. 3 35 26.2	− 10.438					

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h.}	P. L. of Diff.	VI^{h.}	P. L. of Diff.	IX^{h.}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
3	Sun	W.	16 25 22	2949	17 56 39	2950	19 27 55	2953	20 59 07	2957
	Antares	E.	72 00 22	2563	70 20 36	2578	68 41 11	2593	67 02 07	2610
	Saturn	E.	115 18 38	2527	113 38 02	2540	111 57 44	2555	110 17 45	2567
	a Aquilæ	E.	120 43 13	3064	119 14 19	3062	117 45 23	3060	116 16 25	3060
4	Sun	W.	28 32 59	3005	30 03 06	3017	31 32 58	3029	33 02 35	3043
	Antares	E.	58 52 11	2690	57 15 18	2707	55 38 48	2724	54 02 40	2741
	Saturn	E.	102 02 39	2638	100 24 36	2653	98 46 53	2667	97 09 29	2682
	a Aquilæ	E.	108 51 56	3077	107 23 18	3083	105 54 48	3091	104 26 27	3099
	Jupiter	E.	119 16 44	2631	117 38 31	2645	116 00 37	2658	114 23 01	2672
5	Sun	W.	40 26 26	3113	41 54 20	3127	43 21 57	3141	44 49 17	3154
	Antares	E.	46 07 52	2832	44 34 06	2852	43 00 46	2872	41 27 51	2891
	Saturn	E.	89 07 24	2755	87 31 57	2769	85 56 48	2783	84 21 58	2797
	a Aquilæ	E.	97 07 32	3151	95 40 24	3163	94 13 31	3175	92 46 52	3188
	Jupiter	E.	106 19 43	2743	104 44 00	2756	103 08 35	2770	101 33 28	2783
6	Sun	W.	52 01 49	3224	53 27 30	3236	54 52 56	3249	56 18 07	3261
	Spica	W.	12 48 38	2890	14 21 10	2898	15 53 31	2906	17 25 42	2914
	Antares	E.	33 49 54	3004	32 19 46	3030	30 50 10	3056	29 21 07	3087
	Saturn	E.	76 32 18	2865	74 59 14	2878	73 26 27	2891	71 53 56	2903
	a Aquilæ	E.	85 37 35	3258	84 12 34	3272	82 47 50	3288	81 23 24	3302
	Jupiter	E.	93 42 16	2850	92 08 53	2862	90 35 46	2875	89 02 55	2887
	Fomalhaut	E.	115 51 32	3400	114 29 16	3400	113 07 00	3401	111 44 45	3403
7	Sun	W.	63 20 28	3320	64 44 16	3332	66 07 51	3341	67 31 15	3351
	Spica	W.	25 03 56	2959	26 35 00	2969	28 05 52	2977	29 36 34	2985
	Saturn	E.	64 15 13	2962	62 44 12	2972	61 13 24	2982	59 42 49	2993
	a Aquilæ	E.	74 25 45	3384	73 03 10	3400	71 40 54	3418	70 18 58	3436
	Jupiter	E.	81 22 24	2943	79 51 00	2954	78 19 50	2964	76 48 52	2973
	Fomalhaut	E.	104 54 02	3416	103 32 04	3421	102 10 11	3424	100 48 22	3430
	a Pegasi	E.	121 53 48	3200	120 27 39	3204	119 01 34	3206	117 35 32	3209
8	Sun	W.	74 25 36	3393	75 48 00	3401	77 10 15	3408	78 32 23	3413
	Spica	W.	37 07 32	3023	38 37 16	3030	40 06 52	3035	41 36 21	3041
	Saturn	E.	52 12 57	3039	50 43 32	3046	49 14 16	3054	47 45 10	3061
	a Aquilæ	E.	63 34 29	3532	62 14 40	3554	60 55 15	3576	59 36 14	3598
	Jupiter	E.	69 16 51	3016	67 46 58	3024	66 17 15	3030	64 47 40	3037
	Fomalhaut	E.	94 00 45	3456	92 39 32	3462	91 18 25	3467	89 57 24	3473
	a Pegasi	E.	110 26 16	3225	109 00 36	3227	107 34 59	3230	106 09 25	3233
9	Sun	W.	85 21 30	3438	86 43 04	3440	88 04 35	3443	89 26 03	3445
	Spica	W.	49 02 13	3062	50 31 09	3065	52 00 01	3067	53 28 51	3069
	Saturn	E.	40 21 53	3096	38 53 38	3101	37 25 30	3107	35 57 29	3114
	a Aquilæ	E.	53 07 41	3729	51 51 25	3761	50 35 42	3793	49 20 33	3828
	Jupiter	E.	57 21 38	3065	55 52 45	3069	54 23 57	3073	52 55 14	3076
	Fomalhaut	E.	83 14 01	3504	81 53 41	3510	80 33 28	3515	79 13 21	3523
	a Pegasi	E.	99 02 24	3245	97 37 08	3246	96 11 53	3247	94 46 40	3249
10	Sun	W.	96 13 00	3447	97 34 23	3447	98 55 46	3445	100 17 12	3443
	Spica	W.	60 52 37	3071	62 21 22	3070	63 50 08	3069	65 18 56	3067
	Saturn	E.	28 39 18	3147	27 12 05	3156	25 45 03	3164	24 18 11	3174

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			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
3	Sun	W.	22 30 14	2963	24 01 13	2971	25 32 02	2981	27 02 38	2993
	Antares	E.	65 23 25	2625	63 45 04	2640	62 07 04	2657	60 29 26	2674
	Saturn	E.	108 38 05	2582	106 58 45	2596	105 19 44	2610	103 41 02	2624
	a Aquilæ	E.	114 47 26	3060	113 18 28	3063	111 49 33	3066	110 20 42	3070
4	Sun	W.	34 31 55	3056	36 00 58	3070	37 29 44	3083	38 58 14	3098
	Antares	E.	52 26 55	2760	50 51 34	2777	49 16 36	2795	47 42 02	2814
	Saturn	E.	95 32 25	2697	93 55 41	2711	92 19 16	2725	90 43 10	2741
	a Aquilæ	E.	102 58 16	3109	101 30 17	3118	100 02 29	3129	98 34 54	3139
	Jupiter	E.	112 45 44	2687	111 08 46	2701	109 32 07	2714	107 55 46	2728
5	Sun	W.	46 16 21	3168	47 43 08	3183	49 09 37	3196	50 35 51	3209
	Antares	E.	39 55 21	2912	38 23 17	2934	36 51 41	2956	35 20 33	2979
	Saturn	E.	82 47 26	2811	81 13 13	2825	79 39 17	2838	78 05 39	2852
	a Aquilæ	E.	91 20 28	3201	89 54 20	3215	88 28 29	3229	87 02 54	3242
	Jupiter	E.	99 58 38	2798	98 24 07	2811	96 49 53	2824	95 15 56	2837
6	Sun	W.	57 43 04	3274	59 07 46	3287	60 32 13	3298	61 56 27	3309
	Spica	W.	18 57 43	2922	20 29 34	2931	22 01 13	2941	23 32 40	2950
	Antares	E.	27 52 41	3120	26 24 56	3157	24 57 55	3196	23 31 41	3238
	Saturn	E.	70 21 41	2916	68 49 42	2927	67 17 58	2939	65 46 28	2950
	a Aquilæ	E.	79 59 15	3319	78 35 25	3334	77 11 53	3351	75 48 40	3366
	Jupiter	E.	87 30 19	2899	85 57 59	2910	84 25 53	2922	82 54 02	2932
	Fomalhaut	E.	110 22 32	3404	109 00 20	3407	107 38 11	3409	106 16 05	3412
7	Sun	W.	68 54 28	3360	70 17 30	3370	71 40 21	3378	73 03 03	3386
	Spica	W.	31 07 05	2993	32 37 26	3001	34 07 37	3009	35 37 39	3016
	Saturn	E.	58 12 27	3003	56 42 18	3012	55 12 20	3021	53 42 33	3030
	a Aquilæ	E.	68 57 22	3454	67 36 07	3473	66 15 13	3492	64 54 40	3512
	Jupiter	E.	75 18 05	2982	73 47 30	2992	72 17 07	3000	70 46 54	3008
	Fomalhaut	E.	99 26 39	3435	98 05 02	3440	96 43 31	3445	95 22 05	3450
	a Pegasi	E.	116 09 34	3212	114 43 39	3215	113 17 48	3218	111 52 00	3221
8	Sun	W.	79 54 25	3419	81 16 20	3425	82 38 08	3430	83 59 51	3433
	Spica	W.	43 05 43	3047	44 34 58	3051	46 04 08	3055	47 33 13	3059
	Saturn	E.	46 16 13	3069	44 47 26	3076	43 18 47	3082	41 50 16	3089
	a Aquilæ	E.	58 17 38	3622	56 59 27	3647	55 41 43	3673	54 24 27	3701
	Jupiter	E.	63 18 13	3043	61 48 54	3049	60 19 42	3055	58 50 37	3060
	Fomalhaut	E.	88 36 30	3480	87·15 43	3485	85 55 02	3491	84 34 28	3497
	a Pegasi	E.	104 43 55	3236	103 18 28	3238	101 53 04	3241	100 27 43	3242
9	Sun	W.	90 47 29	3446	92 08 53	3448	93 30 15	3448	94 51 37	3447
	Spica	W.	54 57 39	3070	56 26 25	3072	57 55 09	3072	59 23 53	3072
	Saturn	E.	34 29 36	3119	33 01 50	3125	31 34 11	3132	30 06 40	3139
	a Aquilæ	E.	48 06 00	3867	46 52 07	3908	45 38 55	3951	44 26 27	4000
	Jupiter	E.	51 26 35	3079	49 58 00	3082	48 29 29	3085	47 01 01	3087
	Fomalhaut	E.	77 53 22	3529	76 33 30	3536	75 13 46	3543	73 54 09	3550
	a Pegasi	E.	93 21 29	3250	91 56 19	3251	90 31 10	3251	89 06 01	3251
10	Sun	W.	101 38 40	3440	103 00 11	3438	104 21 45	3434	105 43 23	3430
	Spica	W.	66 47 46	3065	68 16 39	3062	69 45 35	3058	71 14 36	3055
	Saturn	E.	22 51 31	3189	21 25 09	3208	19 59 09	3227	18 33 32	3249

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			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	JUPITER	E .	45 32 36	3089	44 04 13	3091	42 35 53	3093	41 07 35	3095
	Fomalhaut	E .	72 34 40	3557	71 15 19	3565	69 56 07	3574	68 37 04	3582
	a Pegasi	E .	87 40 52	3252	86 15 44	3251	84 50 35	3250	83 25 25	3249
11	Sun	W.	107 05 06	3425	108 26 54	3420	109 48 48	3415	111 10 48	3408
	Spica	W.	72 43 41	3050	74 12 52	3046	75 42 08	3040	77 11 31	3034
	Antares	W.	28 08 00	3229	29 33 23	3217	30 59 12	3198	32 25 24	3180
	JUPITER	E .	33 46 32	3103	32 18 26	3105	30 50 23	3108	29 22 23	3111
	Fomalhaut	E .	62 04 17	3632	60 46 18	3645	59 28 32	3659	58 11 01	3675
	a Pegasi	E .	76 19 17	3242	74 53 58	3240	73 28 36	3238	72 03 12	3236
	a Arietis	E .	119 44 27	3151	118 17 19	3144	116 50 03	3136	115 22 37	3128
12	Sun	W.	118 02 40	3372	119 25 28	3364	120 48 26	3354	122 11 35	3345
	Spica	W.	84 40 20	3001	86 10 32	2993	87 40 53	2985	89 11 25	2975
	Antares	W.	39 41 25	3102	41 09 32	3088	42 37 56	3074	44 06 37	3060
	Fomalhaut	E .	51 47 59	3773	50 32 29	3799	49 17 26	3828	48 02 53	3861
	a Pegasi	E .	64 55 35	3225	63 29 56	3224	62 04 15	3222	60 38 32	3220
	a Arietis	E .	108 02 56	3085	106 34 28	3076	105 05 49	3066	103 36 58	3056
13	Spica	W	96 47 01	2927	98 18 46	2917	99 50 43	2906	101 22 54	2894
	Antares	W.	51 34 10	2994	53 04 30	2981	54 35 06	2967	56 06 00	2954
	a Pegasi	E .	53 29 38	3220	52 03 52	3222	50 38 09	3225	49 12 29	3229
	a Arietis	E .	96 09 35	3005	94 39 28	2993	93 09 07	2983	91 38 33	2971
14	Spica	W.	109 07 30	2836	110 41 11	2824	112 15 08	2811	113 49 21	2799
	Antares	W.	63 44 40	2887	65 17 16	2873	66 50 09	2859	68 23 20	2846
	SATURN	W.	20 49 31	2968	22 20 24	2940	23 51 52	2915	25 23 52	2890
	a Pegasi	E .	42 06 01	3276	40 41 22	3293	39 17 02	3313	37 53 05	3337
	a Arietis	E .	84 02 04	2913	82 30 02	2902	80 57 46	2891	79 25 15	2878
	Aldebaran	E .	117 13 08	2838	115 39 30	2825	114 05 34	2811	112 31 21	2799
15	Antares	W.	76 13 38	2778	77 48 35	2765	79 23 49	2750	80 59 22	2738
	SATURN	W.	33 11 14	2788	34 45 58	2769	36 21 06	2753	37 56 36	2736
	JUPITER	W.	17 03 25	2976	18 34 08	2927	20 05 52	2883	21 38 32	2844
	a Arietis	E .	71 38 53	2821	70 04 52	2810	68 30 37	2799	66 56 08	2788
	Aldebaran	E .	104 36 09	2735	103 00 16	2722	101 24 05	2709	99 47 37	2696
16	Antares	W.	89 01 29	2672	90 38 46	2660	92 16 20	2647	93 54 11	2635
	SATURN	W.	45 59 26	2659	47 37 01	2645	49 14 55	2630	50 53 09	2617
	a Aquilæ	W.	43 03 04	3565	44 22 17	3498	45 42 43	3437	47 04 18	3381
	JUPITER	W.	29 32 51	2704	31 09 25	2684	32 46 27	2663	34 23 56	2645
	a Arietis	E .	59 00 15	2738	57 24 26	2730	55 48 26	2722	54 12 16	2715
	Aldebaran	E .	91 40 56	2631	90 02 43	2619	88 24 14	2606	86 45 27	2593
17	Antares	W.	102 07 32	2577	103 46 59	2566	105 26 41	2556	107 06 37	2545
	SATURN	W.	59 08 51	2551	60 48 53	2540	62 29 11	2527	64 09 46	2516
	a Aquilæ	W.	54 06 51	3156	55 33 53	3119	57 01 39	3086	58 30 06	3054
	JUPITER	W.	42 37 16	2564	44 17 00	2550	45 57 04	2536	47 37 27	2522
	a Arietis	E .	46 09 17	2690	44 32 24	2688	42 55 28	2688	41 18 32	2689
	Aldebaran	E .	78 27 21	2533	76 46 54	2522	75 06 12	2511	73 25 14	2500
18	SATURN	W.	72 36 36	2462	74 18 42	2453	76 01 02	2443	77 43 35	2433

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10	Jupiter E.	39 39 19	3096	38 11 05	3097	36 42 52	3099	35 14 41	3101
	Fomalhaut E.	67 18 10	3590	65 59 25	3600	64 40 51	3610	63 22 28	3622
	a Pegasi E.	82 00 14	3248	80 35 02	3247	79 09 49	3246	77 44 34	3244
11	Sun W.	112 32 55	3402	113 55 09	3395	115 17 31	3388	116 40 01	3380
	Spica W.	78 41 01	3029	80 10 38	3022	81 40 23	3015	83 10 17	3008
	Antares W.	33 51 57	3163	35 18 50	3147	36 46 03	3131	38 13 35	3116
	Jupiter E.	27 54 27	3118	26 26 39	3126	24 59 01	3133	23 31 32	3142
	Fomalhaut E.	56 53 47	3691	55 36 50	3708	54 20 11	3727	53 03 53	3750
	a Pegasi E.	70 37 46	3234	69 12 17	3232	67 46 46	3230	66 21 12	3227
	a Arietis E.	113 55 01	3120	112 27 16	3111	110 59 20	3102	109 31 13	3094
12	Sun W.	123 34 54	3336	124 58 24	3326	126 22 05	3316	127 45 58	3304
	Spica W.	90 42 09	2966	92 13 04	2958	93 44 10	2947	95 15 29	2937
	Antares W.	45 35 35	3047	47 04 49	3034	48 34 19	3021	50 04 06	3007
	Fomalhaut E.	46 48 54	3898	45 35 32	3939	44 22 52	3984	43 10 57	4035
	a Pegasi E.	59 12 47	3219	57 47 00	3219	56 21 13	3218	54 55 25	3219
	a Arietis E.	102 07 54	3046	100 38 38	3036	99 09 10	3026	97 39 29	3015
13	Spica W.	102 55 20	2883	104 28 00	2872	106 00 55	2860	107 34 05	2848
	Antares W.	57 37 10	2941	59 08 37	2927	60 40 21	2914	62 12 22	2901
	a Pegasi E.	47 46 54	3235	46 21 26	3242	44 56 06	3251	43 30 57	3262
	a Arietis E.	90 07 44	2960	88 36 41	2948	87 05 23	2937	85 33 51	2925
14	Spica W.	115 23 50	2786	116 58 36	2774	118 33 38	2761	120 08 57	2748
	Antares W.	69 56 48	2832	71 30 34	2819	73 04 37	2805	74 38 59	2792
	Saturn W.	26 56 24	2866	28 29 27	2845	30 02 57	2825	31 36 53	2805
	a Pegasi E.	36 29 36	3366	35 06 41	3403	33 44 28	3445	32 23 02	3492
	a Arietis E.	77 52 28	2866	76 19 26	2855	74 46 10	2844	73 12 39	2832
	Aldebaran E.	110 56 52	2787	109 22 07	2774	107 47 05	2761	106 11 46	2747
15	Antares W.	82 35 12	2724	84 11 20	2711	85 47 45	2698	87 24 28	2684
	Saturn W.	39 32 28	2720	41 08 41	2704	42 45 15	2689	44 22 10	2673
	Jupiter W.	23 12 03	2809	24 46 19	2779	26 21 15	2751	27 56 47	2727
	a Arietis E.	65 21 24	2777	63 46 26	2767	62 11 15	2757	60 35 51	2748
	Aldebaran E.	98 10 52	2683	96 33 49	2670	94 56 29	2657	93 18 51	2644
16	Antares W.	95 32 19	2623	97 10 43	2610	98 49 24	2599	100 28 20	2588
	Saturn W.	52 31 41	2604	54 10 31	2590	55 49 40	2577	57 29 07	2564
	a Aquilæ W.	48 26 56	3329	49 50 34	3281	51 15 08	3236	52 40 35	3194
	Jupiter W.	36 01 50	2627	37 40 08	2610	39 18 49	2594	40 57 52	2579
	a Arietis E.	52 35 56	2708	50 59 27	2702	49 22 50	2697	47 46 06	2693
	Aldebaran E.	85 06 23	2581	83 27 02	2569	81 47 25	2557	80 07 31	2545
17	Antares W.	108 46 47	2535	110 27 11	2526	112 07 48	2517	113 48 38	2509
	Saturn W.	65 50 37	2504	67 31 44	2494	69 13 06	2482	70 54 44	2472
	a Aquilæ W.	59 59 12	3025	61 28 54	2997	62 59 10	2971	64 29 59	2946
	Jupiter W.	49 18 09	2510	50 59 08	2498	52 40 24	2486	54 21 57	2475
	a Arietis E.	39 41 38	2694	38 04 50	2699	36 28 09	2707	34 51 38	2718
	Aldebaran E.	71 44 01	2489	70 02 32	2479	68 20 49	2468	66 38 51	2458
18	Saturn W.	79 26 22	2425	81 09 21	2417	82 52 32	2408	84 35 55	2401

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		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
18	α Aquilæ W.	66 01 20	2924	67 33 09	2903	69 05 24	2883	70 38 05	2864
	Jupiter W.	56 03 46	2463	57 45 51	2453	59 28 10	2443	61 10 44	2432
	Aldebaran E.	64 56 39	2449	63 14 14	2440	61 31 36	2430	59 48 44	2422
	Pollux E.	107 40 10	2549	106 00 05	2538	104 19 44	2526	102 39 07	2516
19	Saturn W.	86 19 29	2393	88 03 14	2386	89 47 09	2379	91 31 14	2373
	α Aquilæ W.	78 26 57	2790	80 01 38	2778	81 36 35	2767	83 11 46	2758
	Jupiter W.	69 46 54	2389	71 30 44	2382	73 14 45	2374	74 58 57	2367
	Aldebaran E.	51 11 24	2382	49 27 23	2374	47 43 11	2368	45 58 50	2362
	Pollux E.	94 12 43	2472	92 30 50	2465	90 48 47	2458	89 06 34	2451
20	Saturn W.	100 13 49	2345	101 58 43	2341	103 43 43	2337	105 28 49	2333
	α Aquilæ W.	91 10 23	2725	92 46 30	2721	94 22 42	2719	95 58 57	2716
	Jupiter W.	83 42 14	2338	85 27 18	2334	87 12 28	2329	88 57 45	2325
	Aldebaran E.	37 14 58	2335	35 29 50	2331	33 44 35	2327	31 59 15	2324
	Pollux E.	80 33 25	2426	78 50 27	2422	77 07 24	2419	75 24 16	2416
21	Saturn W.	114 15 35	2319	116 01 07	2317	117 46 42	2315	119 32 19	2314
	α Aquilæ W.	104 00 21	2724	105 36 29	2729	107 12 31	2735	108 48 25	2743
	Jupiter W.	97 45 31	2309	99 31 17	2307	101 17 06	2305	103 02 58	2303
	Pollux E.	66 47 56	2411	65 04 37	2412	63 21 20	2413	61 38 04	2415
22	α Arietis W.	26 33 28	2684	28 10 30	2643	29 48 27	2606	31 27 14	2573
	Pollux E.	53 02 49	2437	51 20 07	2443	49 37 34	2451	47 55 12	2461
	Sun E	118 52 45	2599	117 13 48	2597	115 34 49	2596	113 55 48	2596
23	α Arietis W.	39 50 16	2473	41 32 07	2460	43 14 16	2450	44 56 40	2441
	Pollux E.	39 27 27	2534	37 47 01	2555	36 07 04	2580	34 27 41	2608
	Sun E.	105 40 40	2596	104 01 39	2596	102 22 38	2596	100 43 38	2598
24	α Arietis W.	53 31 21	2412	55 14 39	2408	56 58 02	2405	58 41 30	2403
	Aldebaran W.	19 30 25	2309	21 16 11	2309	23 01 57	2309	24 47 44	2309
	Sun E.	92 29 03	2604	90 50 14	2606	89 11 27	2608	87 32 43	2610
25	α Arietis W.	67 19 19	2399	69 02 55	2400	70 46 30	2401	72 30 04	2401
	Aldebaran W.	33 36 25	2315	35 22 03	2317	37 07 38	2319	38 53 10	2321
	Sun E.	79 19 46	2622	77 41 21	2625	76 03 00	2627	74 24 42	2631
26	α Arietis W.	81 07 21	2412	82 50 38	2415	84 33 51	2419	86 16 59	2422
	Aldebaran W.	47 39 53	2335	49 25 01	2339	51 10 03	2343	52 55 00	2346
	Sun E.	66 14 22	2649	64 36 33	2652	62 58 49	2656	61 21 10	2660
27	α Arietis W.	94 51 16	2445	96 33 47	2450	98 16 11	2456	99 58 26	2462
	Aldebaran W.	61 38 21	2368	63 22 42	2373	65 06 56	2377	66 51 04	2382
	Sun E.	53 14 27	2684	51 37 26	2690	50 00 33	2695	48 23 47	2701
28	α Arietis W.	108 27 27	2497	110 08 44	2506	111 49 49	2515	113 30 42	2523
	Aldebaran W.	75 29 46	2410	77 13 06	2417	78 56 16	2423	80 39 18	2430
	Sun E.	40 21 55	2733	38 45 59	2740	37 10 12	2747	35 34 35	2754
29	Aldebaran W.	89 11 58	2466	90 53 59	2475	92 35 48	2482	94 17 26	2490
	Sun E.	27 39 04	2797	26 04 32	2806	24 30 12	2816	22 56 05	2827

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		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
18	α Aquilæ W.	72 11 10	2847	73 44 37	2831	75 18 24	2816	76 52 31	2801
	JUPITER W.	62 53 33	2424	64 36 34	2415	66 19 48	2405	68 03 15	2397
	Aldebaran E.	58 05 40	2412	56 22 23	2405	54 38 55	2396	52 55 15	2389
	Pollux E.	100 58 16	2507	99 17 12	2497	97 35 55	2488	95 54 25	2480
19	SATURN W.	93 15 28	2366	94 59 51	2361	96 44 22	2355	98 29 02	2350
	α Aquilæ W.	84 47 09	2750	86 22 43	2741	87 58 28	2735	89 34 22	2729
	JUPITER W.	76 43 19	2361	78 27 50	2355	80 12 29	2349	81 57 17	2343
	Aldebaran E.	44 14 20	2355	42 29 41	2350	40 44 54	2344	38 59 59	2340
	Pollux E.	87 24 12	2445	85 41 41	2440	83 59 03	2434	82 16 17	2430
20	SATURN W.	107 14 01	2329	108 59 18	2326	110 44 40	2323	112 30 06	2321
	α Aquilæ W.	97 35 15	2716	99 11 34	2716	100 47 52	2718	102 24 08	2720
	JUPITER W.	90 43 08	2321	92 28 37	2318	94 14 10	2315	95 59 48	2311
	Aldebaran E.	30 13 50	2321	28 28 21	2318	26 42 48	2316	24 57 12	2315
	Pollux E.	73 41 04	2415	71 57 50	2412	70 14 33	2412	68 31 15	2411
21	SATURN W.	121 17 58	2313	123 03 38	2313	124 49 19	2313	126 35 00	2313
	α Aquilæ W.	110 24 08	2751	111 59 40	2761	113 34 59	2772	115 10 04	2785
	JUPITER W.	104 48 53	2302	106 34 50	2300	108 20 47	2300	110 06 46	2300
	Pollux E.	59 54 51	2418	58 11 42	2422	56 28 38	2426	54 45 40	2431
22	α Arietis W.	33 06 46	2545	34 46 56	2523	36 27 37	2504	38 08 45	2487
	Pollux E.	46 13 04	2472	44 31 11	2485	42 49 36	2498	41 08 20	2515
	SUN E.	112 16 47	2596	110 37 46	2595	108 58 44	2595	107 19 42	2595
23	α Arietis W.	46 39 17	2433	48 22 05	2426	50 05 02	2420	51 48 08	2415
	Pollux E.	32 48 57	2643	31 11 01	2684	29 33 59	2730	27 57 59	2782
	SUN E.	99 04 40	2599	97 25 43	2600	95 46 48	2601	94 07 55	2602
24	α Arietis W.	60 25 01	2401	62 08 34	2401	63 52 07	2399	65 35 43	2399
	Aldebaran W.	26 33 30	2309	28 19 16	2311	30 05 00	2311	31 50 44	2313
	SUN E.	85 54 01	2612	84 15 22	2615	82 36 47	2617	80 58 15	2619
25	α Arietis W.	74 13 37	2403	75 57 07	2405	77 40 35	2407	79 24 00	2410
	Aldebaran W.	40 38 39	2324	42 24 03	2326	44 09 24	2329	45 54 41	2333
	SUN E.	72 46 29	2634	71 08 20	2638	69 30 16	2640	67 52 16	2645
26	α Arietis W.	88 00 02	2426	89 42 59	2430	91 25 51	2434	93 08 37	2439
	Aldebaran W.	54 39 52	2350	56 24 38	2355	58 09 18	2358	59 53 53	2363
	SUN E.	59 43 37	2665	58 06 10	2669	56 28 49	2675	54 51 35	2679
27	α Arietis W.	101 40 33	2468	103 22 31	2475	105 04 20	2482	106 45 59	2489
	Aldebaran W.	68 35 04	2388	70 18 56	2393	72 02 41	2398	73 46 18	2405
	SUN E.	46 47 08	2707	45 10 37	2713	43 34 15	2719	41 58 01	2725
28	α Arietis W.	115 11 23	2534	116 51 49	2543	118 32 02	2553	120 12 01	2564
	Aldebaran W.	82 22 10	2437	84 04 52	2444	85 47 24	2451	87 29 46	2458
	SUN E.	33 59 07	2763	32 23 50	2771	30 48 44	2779	29 13 48	2788
29	Aldebaran W.	95 58 53	2499	97 40 07	2508	99 21 09	2517	101 01 59	2525
	SUN E.	21 22 12	2839	19 48 35	2852	18 15 14	2862	16 42 06	2872

AT GREENWICH APPARENT NOON.

Day of the Wee	Day of the Month	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h　m　s	s	°　′　″	″	′　″	s	m　s	s
Wed.	1	12 27 01.98	+ 9.050	S.　2 55 20.0	− 58.32	15 59.95	64.24	10 04.22	0.804
Thur.	2	12 30 39.32	9.062	3 18 38.6	58.23	16 00.23	64.28	10 23.38	0.792
Frid.	3	12 34 16.96	9.075	3 41 55.2	58.13	16 00.51	64.33	10 42.25	0.780
Sat.	4	12 37 54.90	+ 9.088	4 05 09.1	− 58.02	16 00.78	64.38	11 00.81	0.766
SUN.	5	12 41 33.17	9.102	4 28 20.0	57.89	16 01.06	64.43	11 19.04	0.752
Mon.	6	12 45 11.79	9.117	4 51 27.6	57.74	16 01.33	64.48	11 36.92	0.737
Tues.	7	12 48 50.77	+ 9.132	5 14 31.7	− 57.58	16 01.61	64.54	11 54.44	0.722
Wed.	8	12 52 30.13	9.148	5 37 31.6	57.40	16 01.88	64.60	12 11.59	0.706
Thur.	9	12 56 09.88	9.166	6 00 27.2	57.21	16 02.16	64.67	12 28.34	0.689
Frid.	10	12 59 50.06	+ 9.184	6 23 18.0	− 57.01	16 02.43	64.73	12 44.66	0.671
Sat.	11	13 03 30.69	9.202	6 46 03.7	56.79	16 02.71	64.80	13 00.54	0.652
SUN.	12	13 07 11.77	9.221	7 08 43.8	56.55	16 02.98	64.87	13 15.98	0.633
Mon.	13	13 10 53.32	+ 9.242	7 31 18.0	− 56.29	16 03.26	64.94	13 30.94	0.613
Tues.	14	13 14 35.37	9.263	7 53 46.0	56.02	16 03.54	65.02	13 45.39	0.592
Wed.	15	13 18 17.94	9.285	8 16 07.5	55.74	16 03.82	65.10	13 59.34	0.570
Thur.	16	13 22 01.05	+ 9.308	8 38 21.9	− 55.44	16 04.10	65.18	14 12.75	0.547
Frid.	17	13 25 44.72	9.332	9 00 29.0	55.14	16 04.37	65.26	14 25.59	0.523
Sat.	18	13 29 28.98	9.357	9 22 28.4	54.81	16 04.64	65.34	14 37.85	0.498
SUN.	19	13 33 13.84	+ 9.383	9 44 19.8	− 54.47	16 04.91	65.43	14 49.50	0.472
Mon.	20	13 36 59.33	9.409	10 06 02.7	54.11	16 05.18	65.52	15 00.54	0.445
Tues.	21	13 40 45.47	9.437	10 27 36.7	53.73	16 05.45	65.61	15 10.92	0.418
Wed.	22	13 44 32.29	+ 9.465	10 49 01.5	− 53.34	16 05.72	65.71	15 20.63	0.390
Thur.	23	13 48 19.79	9.494	11 10 16.9	52.93	16 05.98	65.81	15 29.67	0.361
Frid.	24	13 52 08.00	9.524	11 31 22.3	52.50	16 06.25	65.92	15 37.99	0.332
Sat.	25	13 55 56.92	+ 9.554	11 52 17.2	− 52.06	16 06.51	66.02	15 45.61	0.302
SUN.	26	13 59 46.57	9.584	12 13 01.3	51.60	16 06.77	66.12	15 52.50	0.271
Mon.	27	14 03 36.96	9.615	12 33 34.4	51.13	16 07.03	66.23	15 58.65	0.240
Tues.	28	14 07 28.10	+ 9.647	12 53 55.8	− 50.64	16 07.29	66.33	16 04.04	0.209
Wed.	29	14 11 20.01	9.679	13 14 05.2	50.13	16 07.55	66.44	16 08.68	0.177
Thur.	30	14 15 12.68	9.711	13 34 02.1	49.60	16 07.81	66.55	16 12.55	0.145
Frid.	31	14 19 06.12	9.743	13 53 46.2	49.06	16 08.06	66.66	16 15.65	0.112
Sat.	32	14 23 00.35	+ 9.776	S. 14 13 17.0	− 48.49	16 08.31	66.77	16 17.97	0.079

Note.—The mean time of semidiameter passing meridian may be found by subtracting 0.18ˢ from the sidereal time. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

		AT GREENWICH MEAN NOON.						
		THE SUN'S						
Day of the Week.	Day of the Month.	Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	m s	s	h m s
Wed.	1	12 27 03.50	+9.052	S. 2 55 29.8	−58.33	10 04.36	+0.804	12 37 07.86
Thur.	2	12 30 40.89	9.064	3 18 48.7	58.24	10 23.52	0.793	12 41 04.41
Frid.	3	12 34 18.58	9.077	3 42 05.5	58.14	10 42.39	0.780	12 45 00.97
Sat.	4	12 37 56.57	+9.090	4 05 19.7	−58.03	11 00.95	+0.766	12 48 57.52
SUN.	5	12 41 34.89	9.104	4 28 30.9	57.90	11 19.18	0.752	12 52 54.07
Mon.	6	12 45 13.56	9.119	4 51 38.8	57.75	11 37.06	0.737	12 56 50.62
Tues.	7	12 48 52.59	+9.134	5 14 43.1	−57.59	11 54.58	+0.722	13 00 47.17
Wed.	8	12 52 32.00	9.150	5 37 43.3	57.41	12 11.73	0.706	13 04 43.73
Thur.	9	12 56 11.80	9.167	6 00 39.1	57.22	12 28.48	0.689	13 08 40.28
Frid.	10	12 59 52.03	+9.185	6 23 30.1	−57.02	12 44.80	+0.671	13 12 36.83
Sat.	11	13 03 32.70	9.204	6 46 16.0	56.80	13 00.68	0.652	13 16 33.38
SUN.	12	13 07 13.82	9.224	7 08 56.3	56.56	13 16.12	0.633	13 20 29.94
Mon.	13	13 10 55.41	+9.244	7 31 30.7	−56.30	13 31.08	+0.613	13 24 26.49
Tues.	14	13 14 37.51	9.265	7 53 58.9	56.03	13 45.53	0.592	13 28 23.04
Wed.	15	13 18 20.12	9.287	8 16 20.5	55.75	13 59.47	0.570	13 32 19.59
Thur.	16	13 22 03.27	+9.310	8 38 35.0	−55.45	14 12.88	+0.547	13 36 16.15
Frid.	17	13 25 46.98	9.334	9 00 42.2	55.14	14 25.72	0.523	13 40 12.70
Sat.	18	13 29 31.28	9.359	9 22 41.7	54.81	14 37.97	0.498	13 44 09.25
SUN.	19	13 33 16.18	+9.384	9 44 33.2	−54.47	14 49.62	+0.472	13 48 05.80
Mon.	20	13 37 01.71	9.411	10 06 16.2	54.11	15 00.65	0.445	13 52 02.36
Tues.	21	13 40 47.88	9.438	10 27 50.3	53.73	15 11.03	0.418	13 55 58.91
Wed.	22	13 44 34.73	+9.466	10 49 15.2	−53.34	15 20.73	+0.390	13 59 55.46
Thur.	23	13 48 22.26	9.495	11 10 30.6	52.93	15 29.76	0.361	14 03 52.02
Frid.	24	13 52 10.49	9.525	11 31 36.0	52.50	15 38.08	0.332	14 07 48.57
Sat.	25	13 55 59.43	+9.555	11 52 30.9	−52.06	15 45.69	+0.302	14 11 45.12
SUN.	26	13 59 49.11	9.585	12 13 15.0	51.60	15 52.57	0.271	14 15 41.68
Mon.	27	14 03 39.52	9.616	12 33 48.0	51.13	15' 58.71	0.240	14 19 38.23
Tues.	28	14 07 30.68	+9.648	12 54 09.4	−50.64	16 04.10	+0.209	14 23 34.78
Wed.	29	14 11 22.61	9.680	13 14 18.7	50.13	16 08.73	0.177	14 27 31.34
Thur.	30	14 15 15.30	9.712	13 34 15.5	49.60	16 12.59	0.145	14 31 27.89
Frid.	31	14 19 08.76	9.744	13 53 59.5	49.06	16 15.68	0.112	14 35 24.44
Sat.	32	14 23 03.01	+9.777	S.14 13 30.2	−48.49	16 17.99	+0.079	14 39 21.00

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour, + 0.8565ˢ. (Table III.)

AT GREENWICH MEAN NOON.

THE SUN'S

Day of the Month.	Day of the Year.	TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		λ	λ'					
		° ′ ″	′ ″	″	″			h m s
1	274	187 22 22.2	21 37.3	147.62	− 0.07	0.000 3967	− 51.7	11 21 00.27
2	275	188 21 26.0	20 41.1	147.71	+ 0.07	0.000 2720	52.1	11 17 04.36
3	276	189 20 31.9	19 46.9	147.79	0.19	0.000 1466	52.3	11 13 08.45
4	277	190 19 39.7	18 54.6	147.87	+ 0.31	0.000 0206	− 52 6	11 09 12.55
5	278	191 18 49.4	18 04.2	147.94	0.44	9.999 8940	52.8	11 05 16.64
6	279	192 18 00.9	17 15.7	148.02	0.52	9.999 7670	53.0	11 01 20.74
7	280	193 17 14.3	16 29.0	148.10	+ 0.61	9.999 6396	− 53.1	10 57 24.83
8	281	194 16 29.5	15 44.1	148.17	0.66	9.999 5121	53.1	10 53 28.92
9	282	195 15 46.5	15 00.9	148.24	0.70	9.999 3845	53.1	10 49 33.02
10	283	196 15 05.2	14 19.6	148.32	+ 0.71	9.999 2571	− 53.1	10 45 37.11
11	284	197 14 25.8	13 40.1	148.39	0.69	9.999 1298	53.0	10 41 41.20
12	285	198 13 48.1	13 02.3	148.47	0.64	9.999 0029	52.8	10 37 45.30
13	286	199 13 12.2	12 26.3	148.54	+ 0.56	9.998 8765	− 52.5	10 33 49.39
14	287	200 12 38.1	11 52.2	148.62	0.46	9.998 7508	52.2	10 29 53.48
15	288	201 12 05.9	11 19.9	148.70	0.34	9.998 6258	51.9	10 25 57.58
16	289	202 11 35.7	10 49.5	148.78	+ 0.20	9.998 5018	− 51.5	10 22 01.67
17	290	203 11 7.4	10 21.1	148.86	+ 0.06	9.998 3787	51.1	10 18 05.76
18	291	204 10 41.1	09 54.7	148.95	− 0.08	9.998 2567	50.6	10 14 09.86
19	292	205 10 16.9	09 30.5	149.04	− 0.21	9.998 1359	− 50.2	10 10 13.95
20	293	206 09 54.9	09 08.4	149.13	0.34	9.998 0161	49.7	10 06 18.04
21	294	207 09 35.2	08 48.5	149.23	0.44	9.997 8972	49.3	10 02 22.14
22	295	208 09 17.6	08 30.9	149.32	− 0.50	9.997 7793	− 49.0	9 58 26.23
23	296	209 09 02.4	08 15.6	149.41	0.53	9.997 6622	48.7	9 54 30.32
24	297	210 08 49.5	08 02.6	149.50	0.54	9.997 5459	48.4	9 50 34.42
25	298	211 08 38.9	07 51.8	149.60	− 0.50	9.997 4301	− 48.1	9 46 38.51
26	299	212 08 30.5	07 43.3	149.70	0.43	9.997 3148	47.9	9 42 42.60
27	300	213 08 24.3	07 37.0	149.79	0.36	9.997 1999	47.7	9 38 46.69
28	301	214 08 20.2	07 32.8	149.87	− 0.24	9.997 0854	− 47.6	9 34 50.79
29	302	215 08 18.2	07 30.8	149.96	− 0.11	9.996 9712	47.5	9 30 54.88
30	303	216 08 18.3	07 30.7	150.04	+ 0.01	9.996 8573	47.4	9 26 58.97
31	304	217 08 20.3	07 32.6	150.12	0.14	9.996 7437	47.2	9 23 03.06
32	305	218 08 24.1	07 36.4	150.20	+ 0.26	9.996 6305	− 47.1	9 19 07.16

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' to the mean equinox of January 0.0ᵈ of the Besselian fictitious year

Diff. for 1 Hour
− 9.8296ˢ.
(Table II.,

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 32.0	15 27.3	56 54.4	− 1.40	56 37.4	− 1.43	☾		29.3
2	15 22.6	15 17.9	56 20.2	1.43	56 02.9	1.42	0 24.1	+ 1.97	0.8
3	15 13.3	15 08.9	55 46.1	1.38	55 29.8	1.32	1 11.3	1.97	1.8
4	15 04.7	15 00.8	55 14.4	− 1.23	55 00.1	− 1.13	1 58.7	+ 1.98	2.8
5	14 57.3	14 54.3	54 47.3	1.00	54 36.1	0.85	2 46.2	1.98	3.8
6	14 51.7	14 49.8	54 26.8	0.68	54 19.6	0.51	3 33.9	1.99	4.8
7	14 48.4	14 47.7	54 14.6	− 0.31	54 12.0	− 0.11	4 21.6	+ 1.98	5.8
8	14 47.7	14 48.4	54 11.9	+ 0.10	54 14.4	+ 0.32	5 09.1	1.97	6.8
9	14 49.7	14 51.9	54 19.5	0.53	54 27.3	0.75	5 56.2	1.96	7.8
10	14 54.7	14 58.2	54 37.6	+ 0.96	54 50.4	+ 1.17	6 43.0	+ 1.94	8.8
11	15 02.3	15 07.0	55 05.6	1.35	55 23.0	1.53	7 29.5	1.94	9.8
12	15 12.3	15 18.1	55 42.4	1.68	56 03.4	1.81	8 16.0	1.94	10.8
13	15 24.2	15 30.5	56 25.9	+ 1.91	56 49.3	+ 1.97	9 02.9	+ 1.97	11.8
14	15 37.1	15 43.6	57 13.2	2.00	57 37.2	1.98	9 50.8	2.02	12.8
15	15 50.0	15 56.2	58 00.8	1.93	58 23.5	1.83	10 40.1	2.10	13.8
16	16 02.0	16 07.3	58 44.7	+ 1.69	59 04.1	+ 1.52	11 31.5	+ 2.19	14.8
17	16 11.9	16 15.9	59 21.2	1.31	59 35.6	1.08	12 25.4	2.30	15.8
18	16 19.0	16 21.2	59 47.0	0.82	59 55.3	0.56	13 21.8	2.40	16.8
19	16 22.6	16 23.2	60 00.4	+ 0.30	60 02.5	+ 0.04	14 20.4	+ 2.47	17.8
20	16 22.9	16 21.9	60 01.5	− 0.20	59 57.7	− 0.40	15 20.0	2.48	18.8
21	16 20.2	16 17.9	59 51.4	0.61	59 43.0	0.78	16 19.4	2.45	19.8
22	16 15.1	16 11.9	59 32.7	- 0.92	59 20.9	− 1.03	17 17.2	+ 2.36	20.8
23	16 08.3	16 04.5	59 07.9	1.12	58 54.0	1.18	18 12.7	2.26	21.8
24	16 00.6	15 56.5	58 39.5	1.23	58 24.5	1.25	19 05.5	2.15	22.8
25	15 52.4	15 48.2	58 09.3	− 1.27	57 54.0	− 1.27	19 55.9	+ 2.06	23.8
26	15 44.0	15 39.8	57 38.7	1.28	57 23.3	1.28	20 44.4	1.99	24.8
27	15 35.7	15 31.6	57 08.1	1.26	56 53.0	1.25	21 31.8	1.96	25.8
28	15 27.5	15 23.4	56 38.0	− 1.24	56 23.2	− 1.23	22 18.5	+ 1.94	26.8
29	15 19.5	15 15.6	56 08.6	1.20	55 54.2	1.18	23 05.2	1.95	27.8
30	15 11.7	15 08.0	55 40.2	1.15	55 26.5	1.11	23 52.1	1.96	28.8
31	15 04.4	15 01.0	55 13.4	1.06	55 01.0	1.00	☾		0.2
32	14 57.9	14 54.9	54 49.3	− 0.93	54 38.5	− 0.85	0 39.5	+ 1.98	1.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 1.					**FRIDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 14 33.79	+ 2.0851	S. 3 35 26.2	− 10.438	0	13 54 05.56	+ 2.0703	S.11 11 28.9	− 8.287
1	12 16 38.87	2.0842	3 45 51.7	10.411	1	13 56 09.78	2.0705	11 19 44.3	8.227
2	12 18 43.90	2.0834	3 56 15.5	10.383	2	13 58 14.02	2.0707	11 27 56.1	8.165
3	12 20 48.88	2.0826	4 06 37.7	10.355	3	14 00 18.26	2.0708	11 36 04.1	8.102
4	12 22 53 81	2.0818	4 16 58.1	10.325	4	14 02 22.51	2.0710	11 44 08.4	8.040
5	12 24 58.70	2.0810	4 27 16.7	10 295	5	14 04 26.78	2.0712	11 52 08.9	7.977
6	12 27 03.53	2.0802	4 37 33.5	10.264	6	14 06 31.05	2.0713	12 00 05.6	7.912
7	12 29 08.33	2.0796	4 47 48.4	10.232	7	14 08 35.34	2.0717	12 07 58.4	7.847
8	12 31 13.08	2.0788	4 58 01.4	10.200	8	14 10 39.65	2.0719	12 15 47.3	7.782
9	12 33 17.79	2.0782	5 08 12.4	10.167	9	14 12 43.97	2.0721	12 23 32.3	7.717
10	12 35 22.47	2.0776	5 18 21.4	10.132	10	14 14 48.30	2.0723	12 31 13.4	7.652
11	12 37 27.10	2.0769	5 28 28.2	10.097	11	14 16 52.64	2.0725	12 38 50.5	7.585
12	12 39 31.70	2.0764	5 38 33.0	10.062	12	14 18 57.00	2.0728	12 46 23.6	7.518
13	12 41 36.27	2.0758	5 48 35.6	10.024	13	14 21 01.38	2.0732	12 53 52.7	7.451
14	12 43 40.80	2.0753	5 58 35.9	9.987	14	14 23 05.78	2.0735	13 01 17.7	7.382
15	12 45 45.31	2.0748	6 08 34.0	9.948	15	14 25 10.20	2.0737	13 08 38.6	7.314
16	12 47 49.78	2.0743	6 18 29.7	9.909	16	14 27 14.63	2.0740	13 15 55.4	7.245
17	12 49 54.23	2.0739	6 28 23.1	9.870	17	14 29 19.08	2.0743	13 23 08.0	7.176
18	12 51 58.65	2.0734	6 38 14.1	9.829	18	14 31 23.55	2.0746	13 30 16.5	7.107
19	12 54 03.04	2.0731	6 48 02.6	9.788	19	14 33 28.03	2.0749	13 37 20.8	7.036
20	12 56 07.42	2.0727	6 57 48.7	9.747	20	14 35 32.54	2.0752	13 44 20.8	6.965
21	12 58 11.77	2.0723	7 07 32.2	9.703	21	14 37 37.06	2.0755	13 51 16.6	6.894
22	13 00 16.10	2.0720	7 17 13.0	9.659	22	14 39 41.60	2.0758	13 58 08.1	6.822
23	13 02 20.41	+ 2.0717	S. 7 26 51.3	− 9.615	23	14 41 46.16	+ 2.0762	S.14 04 55.3	− 6.750
	THURSDAY 2.					**SATURDAY 4.**			
0	13 04 24.70	+ 2.0714	S. 7 36 26.8	− 9.569	0	14 43 50.74	+ 2.0765	S.14 11 38.1	− 6.677
1	13 06 28.98	2.0712	7 45 59.6	9.524	1	14 45 55.34	2.0768	14 18 16.6	6.605
2	13 08 33.24	2.0709	7 55 29.7	9.478	2	14 47 59.96	2.0772	14 24 50.7	6.531
3	13 10 37.49	2.0707	8 04 57.0	9.431	3	14 50 04.60	2.0775	14 31 20.3	6.457
4	13 12 41.73	2.0705	8 14 21.4	9.382	4	14 52 09.26	2.0778	14 37 45.6	6.384
5	13 14 45.95	2.0703	8 23 42.9	9.334	5	14 54 13.94	2.0781	14 44 06.4	6.309
6	13 16 50.17	2.0702	8 33 01.5	9.285	6	14 56 18.63	2.0784	14 50 22.7	6.233
7	13 18 54.38	2.0701	8 42 17.1	9.234	7	14 58 23.35	2.0788	14 56 34.4	6.158
8	13 20 58.58	2.0699	8 51 29.6	9.184	8	15 00 28.09	2.0792	15 02 41.7	6.083
9	13 23 02.77	2.0697	9 00 39.2	9.133	9	15 02 32.85	2.0794	15 08 44.4	6.007
10	13 25 06.95	2.0697	9 09 45.6	9.081	10	15 04 37.62	2.0798	15 14 42.5	5.931
11	13 27 11.13	2.0697	9 18 48.9	9.028	11	15 06 42.42	2.0802	15 20 36.1	5.854
12	13 29 15.31	2.0697	9 27 49.0	8.975	12	15 08 47.24	2.0804	15 26 25.0	5.777
13	13 31 19.49	2.0696	9 36 45.9	8.921	13	15 10 52.07	2.0807	15 32 09.3	5.700
14	13 33 23.66	2.0696	9 45 39.5	8.867	14	15 12 56.92	2.0811	15 37 49.0	5.622
15	13 35 27.84	2.0697	9 54 29.9	8.812	15	15 15 01.80	2.0814	15 43·23.9	5.543
16	13 37 32.02	2.0696	10 03 16.9	8.756	16	15 17 06.69	2.0817	15 48 54.2	5.466
17	13 39 36.19	2.0696	10 12 00.6	8.700	17	15 19 11.60	2.0819	15 54 19.8	5.387
18	13 41 40.37	2.0697	10 20 40.9	8.642	18	15 21 16.52	2.0823	15 59 40.6	5.307
19	13 43 44.56	2.0698	10 29 17.7	8.584	19	15 23 21.47	2.0827	16 04 56.7	5.228
20	13 45 48.75	2.0698	10 37 51.0	8.526	20	15 25 26.44	2.0829	16 10 08.0	5.148
21	13 47 52.94	2.0699	10 46 20.8	8.467	21	15 27 31.42	2.0832	16 15 14.5	5.069
22	13 49 57.14	2.0701	10 54 47.1	8.408	22	15 29 36.42	2.0835	16 20 16.3	4.989
23	13 52 01.35	2.0702	11 03 09.8	8.348	23	15 31 41.44	2.0838	16 25 13.2	4.907
24	13 54 05.56	+ 2.0703	S.11 11 28.9	− 8.287	24	15 33 46.48	+ 2.0842	S.16 30 05.2	− 4.827

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 5.					**TUESDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 33 46.48	+ 2.0842	S.16 30 05.2	− 4.827	0	17 13 58.19	+ 2.0862	S.18 45 02.5	− 0.747
1	15 35 51.54	2.0844	16 34 52.4	4.747	1	17 16 03.36	2.0861	18 45 44.8	0.661
2	15 37 56.61	2.0847	16 39 34.8	4.665	2	17 18 08.52	2.0859	18 46 21.8	0.573
3	15 40 01.70	2.0849	16 44 12.2	4.583	3	17 20 13.67	2.0857	18 46 53.6	0.487
4	15 42 06.80	2.0852	16 48 44.8	4.502	4	17 22 18.80	2.0853	18 47 20.2	0.400
5	15 44 11.92	2.0855	16 53 12.4	4.419	5	17 24 23.91	2.0850	18 47 41.6	0.312
6	15 46 17.06	2.0857	16 57 35.1	4.337	6	17 26 29.00	2.0847	18 47 57.7	0.226
7	15 48 22.21	2.0859	17 01 52.9	4.255	7	17 28 34.07	2.0843	18 48 08.7	0.140
8	15 50 27.37	2.0862	17 06 05.7	4.172	8	17 30 39.12	2.0840	18 48 14.5	− 0.052
9	15 52 32.55	2.0864	17 10 13.6	4.090	9	17 32 44.15	2.0837	18 48 15.0	+ 0.035
10	15 54 37.74	2.0867	17 14 16.5	4.006	10	17 34 49.17	2.0834	18 48 10.3	0.121
11	15 56 42.95	2.0868	17 18 14.3	3.922	11	17 36 54.16	2.0829	18 48 00.5	0.207
12	15 58 48.16	2.0870	17 22 07.2	3.840	12	17 38 59.12	2.0826	18 47 45.4	0.295
13	16 00 53.39	2.0872	17 25 55.1	3.756	13	17 41 04.07	2.0822	18 47 25.1	0.381
14	16 02 58.63	2.0874	17 29 37.9	3.672	14	17 43 08.99	2.0818	18 46 59.7	0.467
15	16 05 03.88	2.0876	17 33 15.7	3.588	15	17 45 13.89	2.0814	18 46 29.0	0.554
16	16 07 09.14	2.0877	17 36 48.5	3.503	16	17 47 18.76	2.0810	18 45 53.2	0.640
17	16 09 14.41	2.0879	17 40 16.1	3.418	17	17 49 23.61	2.0807	18 45 12.2	0.726
18	16 11 19.69	2.0880	17 43 38.7	3.335	18	17 51 28.44	2.0802	18 44 26.1	0.812
19	16 13 24.97	2.0881	17 46 56.3	3.250	19	17 53 33.23	2.0797	18 43 34.8	0.898
20	16 15 30.26	2.0882	17 50 08.7	3.165	20	17 55 38.00	2.0792	18 42 38.3	0.985
21	16 17 35.55	2.0883	17 53 16.1	3.080	21	17 57 42.74	2.0788	18 41 36.6	1.071
22	16 19 40.86	2.0884	17 56 18.3	2.994	22	17 59 47.46	2.0783	18 40 29.8	1.157
23	16 21 46.16	+ 2.0884	S.17 59 15.4	− 2.908	23	18 01 52.14	+ 2.0777	S.18 39 17.8	+ 1.242
	MONDAY 6.					**WEDNESDAY 8.**			
0	16 23 51.47	+ 2.0885	S.18 02 07.3	− 2.823	0	18 03 56.79	+ 2.0773	S.18 38 00.7	+ 1.327
1	16 25 56.78	2.0886	18 04 54.2	2.738	1	18 06 01.42	2.0768	18 36 38.5	1.413
2	16 28 02.10	2.0887	18 07 35.9	2.652	2	18 08 06.01	2.0762	18 35 11.1	1.499
3	16 30 07.42	2.0886	18 10 12.4	2.566	3	18 10 10.57	2.0758	18 33 38.6	1.584
4	16 32 12.73	2.0886	18 12 43.8	2.480	4	18 12 15.11	2.0753	18 32 01.0	1.669
5	16 34 18.05	2.0887	18 15 10.0	2.394	5	18 14 19.61	2.0747	18 30 18.3	1.754
6	16 36 23.37	2.0886	18 17 31.1	2.308	6	18 16 24.08	2.0742	18 28 30.5	1.838
7	16 38 28.68	2.0886	18 19 47.0	2.222	7	18 18 28.51	2.0737	18 26 37.7	1.923
8	16 40 34.00	2.0886	18 21 57.7	2.136	8	18 20 32.92	2.0732	18 24 39.7	2.008
9	16 42 39.31	2.0885	18 24 03.3	2.050	9	18 22 37.29	2.0726	18 22 36.7	2.093
10	16 44 44.62	2.0884	18 26 03.7	1.962	10	18 24 41.63	2.0720	18 20 28.6	2.177
11	16 46 49.92	2.0883	18 27 58.8	1.876	11	18 26 45.93	2.0714	18 18 15.4	2.262
12	16 48 55.22	2.0883	18 29 48.8	1.790	12	18 28 50.20	2.0708	18 15 57.2	2.345
13	16 51 00.52	2.0882	18 31 33.6	1.703	13	18 30 54.43	2.0702	18 13 34.0	2.429
14	16 53 05.81	2.0881	18 33 13.2	1.617	14	18 32 58.63	2.0697	18 11 05.7	2.513
15	16 55 11.09	2.0879	18 34 47.6	1.529	15	18 35 02.80	2.0692	18 08 32.4	2.597
16	16 57 16.36	2.0878	18 36 16.7	1.442	16	18 37 06.93	2.0685	18 05 54.1	2.680
17	16 59 21.63	2.0877	18 37 40.7	1.356	17	18 39 11.02	2.0678	18 03 10.8	2.763
18	17 01 26.89	2.0875	18 38 59.4	1.269	18	18 41 15.07	2.0672	18 00 22.5	2.846
19	17 03 32.13	2.0873	18 40 13.0	1.182	19	18 43 19.09	2.0667	17 57 29.3	2.928
20	17 05 37.37	2.0872	18 41 21.3	1.095	20	18 45 23.08	2.0662	17 54 31.1	3.012
21	17 07 42.59	2.0870	18 42 24.4	1.009	21	18 47 27.03	2.0655	17 51 27.9	3.095
22	17 09 47.81	2.0868	18 43 22.4	0.922	22	18 49 30.94	2.0648	17 48 19.7	3.177
23	17 11 53.01	2.0865	18 44 15.1	0.834	23	18 51 34.81	2.0642	17 45 06.7	3.258
24	17 13 58.19	+ 2.0862	S.18 45 02.5	− 0.747	24	18 53 38.65	+ 2.0637	S.17 41 48.7	+ 3.341

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension	Diff. for 1 Minute	Declination.	Diff. for 1 Minute
	THURSDAY 9.					**SATURDAY 11.**			
	h m s	s	° ′ ″			h m s	s	° ′ ″	
0	18 53 38.65	+ 2.0637	S.17 41 48.7	+ 3.341	0	20 32 03.48	+ 2.0402	S.13 31 44.2	+ 6.970
1	18 55 42.45	2.0630	17 38 25.8	3.422	1	20 34 05.89	2.0401	13 24 44.0	7.037
2	18 57 46.21	2.0624	17 34 58.0	3.503	2	20 36 08.29	2.0399	13 17 39.7	7.106
3	18 59 49.94	2.0618	17 31 25.4	3.584	3	20 38 10.68	2.0398	13 10 31.3	7.173
4	19 01 53.63	2.0612	17 27 47.9	3.666	4	20 40 13.07	2.0397	13 03 19.0	7.239
5	19 03 57.28	2.0605	17 24 05.5	3.747	5	20 42 15.44	2.0395	12 56 02.6	7.306
6	19 06 00.89	2.0599	17 20 18.2	3.827	6	20 44 17.81	2.0395	12 48 42.3	7.371
7	19 08 04.47	2.0593	17 16 26.2	3.907	7	20 46 20.18	2.0394	12 41 18.1	7.437
8	19 10 08.01	2.0587	17 12 29.3	3.988	8	20 48 22.54	2.0393	12 33 49.9	7.502
9	19 12 11.52	2.0582	17 08 27.6	4.068	9	20 50 24.90	2.0393	12 26 17.8	7.567
10	19 14 14.99	2.0575	17 04 21.1	4.147	10	20 52 27.25	2.0393	12 18 41.9	7.631
11	19 16 18.42	2.0568	17 00 09.9	4.227	11	20 54 29.61	2.0394	12 11 02.1	7.695
12	19 18 21.81	2.0562	16 55 53.9	4.306	12	20 56 31.98	2.0394	12 03 18.5	7.758
13	19 20 25.17	2.0557	16 51 33.2	4.385	13	20 58 34.34	2.0394	11 55 31.1	7.821
14	19 22 28.49	2.0551	16 47 07.7	4.464	14	21 00 36.71	2.0396	11 47 40.0	7.883
15	19 24 31.78	2.0545	16 42 37.5	4.543	15	21 02 39.09	2.0397	11 39 45.1	7.947
16	19 26 35.03	2.0539	16 38 02.5	4.622	16	21 04 41.47	2.0397	11 31 46.4	8.008
17	19 28 38.25	2.0534	16 33 22.9	4.698	17	21 06 43.86	2.0399	11 23 44.1	8.069
18	19 30 41.44	2.0527	16 28 38.7	4.776	18	21 08 46.26	2.0402	11 15 38.1	8.130
19	19 32 44.58	2.0522	16 23 49.8	4.854	19	21 10 48.68	2.0404	11 07 28.5	8.190
20	19 34 47.70	2.0517	16 18 56.2	4.932	20	21 12 51.11	2.0406	10 59 15.3	8.250
21	19 36 50.78	2.0511	16 13 58.0	5.008	21	21 14 53.55	2.0408	10 50 58.5	8.309
22	19 38 53.83	2.0505	16 08 55.2	5.085	22	21 16 56.01	2.0412	10 42 38.2	8.368
23	19 40 56.84	+ 2.0499	S.16 03 47.8	+ 5.161	23	21 18 58.49	+ 2.0415	S.10 34 14.3	+ 8.427
	FRIDAY 10.					**SUNDAY 12.**			
0	19 42 59.82	+ 2.0494	S.15 58 35.9	+ 5.237	0	21 21 00.99	+ 2.0418	S.10 25 46.9	+ 8.485
1	19 45 02.77	2.0489	15 53 19.4	5.313	1	21 23 03.51	2.0422	10 17 16.1	8.542
2	19 47 05.69	2.0484	15 47 58.3	5.388	2	21 25 06.06	2.0427	10 08 41.8	8.600
3	19 49 08.58	2.0479	15 42 32.8	5.463	3	21 27 08.63	2.0430	10 00 04.1	8.657
4	19 51 11.44	2.0474	15 37 02.7	5.539	4	21 29 11.22	2.0435	9 51 23.0	8.712
5	19 53 14.27	2.0469	15 31 28.1	5.613	5	21 31 13.85	2.0440	9 42 38.6	8.767
6	19 55 17.07	2.0465	15 25 49.1	5.687	6	21 33 16.50	2.0445	9 33 50.9	8.822
7	19 57 19.85	2.0460	15 20 05.6	5.762	7	21 35 19.19	2.0451	9 24 59.9	8.877
8	19 59 22.59	2.0455	15 14 17.7	5.855	8	21 37 21.91	2.0456	9 16 05.6	8.931
9	20 01 25.31	2.0452	15 08 25.4	5.908	9	21 39 24.66	2.0462	9 07 08.2	8.984
10	20 03 28.01	2.0447	15 02 28.7	5.982	10	21 41 27.46	2.0469	8 58 07.5	9.037
11	20 05 30.68	2.0442	14 56 27.6	6.055	11	21 43 30.29	2.0475	8 49 03.7	9.090
12	20 07 33.32	2.0438	14 50 22.1	6.127	12	21 45 33.16	2.0482	8 39 56.7	9.142
13	20 09 35.94	2.0435	14 44 12.3	6.199	13	21 47 36.08	2.0490	8 30 46.7	9.192
14	20 11 38.54	2.0431	14 37 58.2	6.271	14	21 49 39.04	2.0497	8 21 33.6	9.243
15	20 13 41.11	2.0427	14 31 39.8	6.342	15	21 51 42.05	2.0506	8 12 17.5	9.293
16	20 15 43.67	2.0425	14 25 17.1	6.413	16	21 53 45.11	2.0514	8 02 58.4	9.342
17	20 17 46.21	2.0421	14 18 50.2	6.484	17	21 55 48.22	2.0522	7 53 36.4	9.392
18	20 19 48.72	2.0417	14 12 19.0	6.555	18	21 57 51.38	2.0531	7 44 11.4	9.441
19	20 21 51.22	2.0415	14 05 43.6	6.624	19	21 59 54.59	2.0541	7 34 43.5	9.488
20	20 23 53.70	2.0412	13 59 04.1	6.694	20	22 01 57.87	2.0551	7 25 12.8	9.535
21	20 25 56.17	2.0410	13 52 20.3	6.764	21	22 04 01.20	2.0560	7 15 39.3	9.582
22	20 27 58.62	2.0407	13 45 32.4	6.832	22	22 06 04.59	2.0570	7 06 03.0	9.627
23	20 30 01.06	2.0405	13 38 40.4	6.902	23	22 08 08.04	2.0581	6 56 24.0	9.672
24	20 32 03.48	+ 2.0402	S.13 31 44.2	+ 6.970	24	22 10 11.56	+ 2.0592	S. 6 46 42.4	+ 9.716

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 13. / WEDNESDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	o ' "	"		h m s	s	o ' "	"
0	22 10 11.56	+2.0592	S. 6 46 42.4	+9.716	0	23 50 59.70	+2.1554	N. 1 37 11.4	+10.958
1	22 12 15.15	2.0603	6 36 58.1	9.761	1	23 53 09.11	2.1582	1 48 09.0	10.962
2	22 14 18.80	2.0615	6 27 11.1	9.804	2	23 55 18.69	2.1612	1 59 06.8	10.964
3	22 16 22.53	2.0627	6 17 21.6	9.847	3	23 57 28.46	2.1642	2 10 04.7	10.966
4	22 18 26.33	2.0639	6 07 29.5	9.889	4	23 59 38.40	2.1672	2 21 02.7	10.967
5	22 20 30.20	2.0652	5 57 34.9	9.930	5	0 01 48.53	2.1703	2 32 00.7	10.966
6	22 22 34.15	2.0666	5 47 37.9	9.971	6	0 03 58.84	2.1734	2 42 58.6	10.964
7	22 24 38.19	2.0679	5 37 38.4	10.011	7	0 06 09.34	2.1766	2 53 56.4	10.962
8	22 26 42.30	2.0692	5 27 36.6	10.050	8	0 08 20.03	2.1797	3 04 54.0	10.957
9	22 28 46.50	2.0707	5 17 32.4	10.089	9	0 10 30.91	2.1830	3 15 51.2	10.952
10	22 30 50.78	2.0722	5 07 25.9	10.127	10	0 12 41.99	2.1862	3 26 48.2	10.947
11	22 32 55.16	2.0737	4 57 17.2	10.163	11	0 14 53.26	2.1894	3 37 44.8	10.939
12	22 34 59.62	2.0752	4 47 06.3	10.200	12	0 17 04.72	2.1927	3 48 40.9	10.931
13	22 37 04.18	2.0767	4 36 53.2	10.236	13	0 19 16.39	2.1961	3 59 36.5	10.921
14	22 39 08.83	2.0782	4 26 38.0	10.270	14	0 21 28.25	2.1994	4 10 31.4	10.910
15	22 41 13.57	2.0799	4 16 20.8	10.304	15	0 23 40.32	2.2029	4 21 25.7	10.898
16	22 43 18.42	2.0817	4 06 01.5	10.338	16	0 25 52.60	2.2063	4 32 19.2	10.885
17	22 45 23.37	2.0834	3 55 40.2	10.372	17	0 28 05.08	2.2097	4 43 11.9	10.871
18	22 47 28.43	2.0852	3 45 16.9	10.403	18	0 30 17.77	2.2132	4 54 03.7	10.856
19	22 49 33.59	2.0869	3 34 51.8	10.434	19	0 32 30.67	2.2167	5 04 54.6	10.839
20	22 51 38.86	2.0887	3 24 24.8	10.464	20	0 34 43.78	2.2203	5 15 44.4	10.821
21	22 53 44.24	2.0906	3 13 56.1	10.493	21	0 36 57.11	2.2239	5 26 33.1	10.802
22	22 55 49.73	2.0925	3 03 25.6	10.523	22	0 39 10.65	2.2275	5 37 20.7	10.782
23	22 57 55.34	+2.0944	S. 2 52 53.3	+10.551	23	0 41 24.41	+2.2312	N. 5 48 07.0	+10.761

TUESDAY 14. / THURSDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 00 01.06	+2.0963	S. 2 42 19.5	+10.577	0	0 43 38.39	+2.2348	N. 5 58 52.0	+10.738
1	23 02 06.90	2.0984	2 31 44.0	10.604	1	0 45 52.59	2.2385	6 09 35.6	10.714
2	23 04 12.87	2.1005	2 21 07.0	10.629	2	0 48 07.01	2.2422	6 20 17.7	10.689
3	23 06 18.96	2.1026	2 10 28.5	10.653	3	0 50 21.66	2.2460	6 30 58.3	10.662
4	23 08 25.18	2.1047	1 59 48.6	10.677	4	0 52 36.53	2.2497	6 41 37.2	10.635
5	23 10 31.53	2.1069	1 49 07.2	10.701	5	0 54 51.62	2.2535	6 52 14.5	10.607
6	23 12 38.01	2.1091	1 38 24.5	10.722	6	0 57 06.95	2.2573	7 02 50.0	10.576
7	23 14 44.62	2.1113	1 27 40.5	10.743	7	0 59 22.50	2.2612	7 13 23.6	10.544
8	23 16 51.37	2.1137	1 16 55.3	10.764	8	1 01 38.29	2.2650	7 23 55.3	10.512
9	23 18 58.26	2.1159	1 06 08.8	10.783	9	1 03 54.30	2.2688	7 34 25.0	10.477
10	23 21 05.28	2.1182	0 55 21.3	10.801	10	1 06 10.55	2.2727	7 44 52.6	10.442
11	23 23 12.45	2.1207	0 44 32.7	10.819	11	1 08 27.03	2.2767	7 55 18.1	10.406
12	23 25 19.77	2.1232	0 33 43.0	10.836	12	1 10 43.75	2.2806	8 05 41.3	10.367
13	23 27 27.23	2.1256	0 22 52.4	10.851	13	1 13 00.70	2.2845	8 16 02.2	10.329
14	23 29 34.84	2.1282	0 12 00.9	10.866	14	1 15 17.89	2.2885	8 26 20.8	10.289
15	23 31 42.61	2.1307	S. 0 01 08.5	10.880	15	1 17 35.32	2.2925	8 36 36.9	10.247
16	23 33 50.52	2.1332	N. 0 09 44.7	10.892	16	1 19 52.99	2.2964	8 46 50.4	10.203
17	23 35 58.60	2.1359	0 20 38.6	10.904	17	1 22 10.89	2.3004	8 57 01.3	10.159
18	23 38 06.83	2.1386	0 31 33.2	10.914	18	1 24 29.04	2.3045	9 07 09.5	10.114
19	23 40 15.23	2.1413	0 42 28.3	10.924	19	1 26 47.43	2.3085	9 17 15.0	10.067
20	23 42 23.79	2.1440	0 53 24.1	10.933	20	1 29 06.06	2.3125	9 27 17.5	10.018
21	23 44 32.51	2.1467	1 04 20.3	10.941	21	1 31 24.93	2.3166	9 37 17.2	9.969
22	23 46 41.40	2.1496	1 15 17.0	10.947	22	1 33 44.05	2.3207	9 47 13.8	9.918
23	23 48 50.46	2.1525	1 26 14.0	10.953	23	1 36 03.41	2.3247	9 57 07.4	9.866
24	23 50 59.70	+2.1554	N. 1 37 11.4	+10.958	24	1 38 23.01	+2.3287	N.10 06 57.7	+9.812

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 17.					**SUNDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 38 23.01	+ 2.3287	N.10 06 57.7	+ 9.812	0	3 34 39.42	+ 2.5055	N.16 31 43.5	+ 5.756
1	1 40 42.86	2.3328	10 16 44.8	9.757	1	3 37 09.83	2.5082	16 37 25.5	5.643
2	1 43 02.95	2.3369	10 26 28.6	9.701	2	3 39 40.40	2.5108	16 43 00.7	5.531
3	1 45 23.29	2.3410	10 36 08.9	9.643	3	3 42 11.13	2.5134	16 48 29.2	5.417
4	1 47 43.87	2.3451	10 45 45.7	9.584	4	3 44 42.01	2.5159	16 53 50.8	5.302
5	1 50 04.70	2.3492	10 55 19.0	9.524	5	3 47 13.04	2.5183	16 59 05.4	5.187
6	1 52 25.77	2.3532	11 04 48.6	9.462	6	3 49 44.21	2.5207	17 04 13.2	5.072
7	1 54 47.09	2.3573	11 14 14.5	9.400	7	3 52 15.53	2.5231	17 09 14.0	4.954
8	1 57 08.65	2.3614	11 23 36.6	9.337	8	3 54 46.98	2.5252	17 14 07.7	4.836
9	1 59 30.46	2.3655	11 32 54.9	9.271	9	3 57 18.56	2.5274	17 18 54.3	4.717
10	2 01 52.51	2.3695	11 42 09.1	9.203	10	3 59 50.27	2.5296	17 23 33.8	4.599
11	2 04 14.80	2.3735	11 51 19.3	9.136	11	4 02 22.11	2.5316	17 28 06.2	4.479
12	2 06 37.33	2.3776	12 00 25.4	9.067	12	4 04 54.06	2.5335	17 32 31.3	4.357
13	2 09 00.11	2.3817	12 09 27.3	8.995	13	4 07 26.13	2.5354	17 36 49.1	4.237
14	2 11 23.13	2.3857	12 18 24.8	8.922	14	4 09 58.31	2.5372	17 40 59.7	4.115
15	2 13 46.39	2.3896	12 27 18.0	8.850	15	4 12 30.59	2.5389	17 45 02.9	3.992
16	2 16 09.88	2.3936	12 36 06.8	8.776	16	4 15 02.98	2.5406	17 48 58.7	3.869
17	2 18 33.62	2.3977	12 44 51.1	8.700	17	4 17 35.46	2.5421	17 52 47.2	3.746
18	2 20 57.60	2.4017	12 53 30.8	8.622	18	4 20 08.03	2.5435	17 56 28.2	3.621
19	2 23 21.82	2.4056	13 02 05.8	8.543	19	4 22 40.68	2.5449	18 00 01.7	3.497
20	2 25 46.27	2.4094	13 10 36.0	8.463	20	4 25 13.42	2.5462	18 03 27.8	3.372
21	2 28 10.95	2.4133	13 19 01.4	8.383	21	4 27 46.23	2.5475	18 06 46.3	3.245
22	2 30 35.87	2.4172	13 27 22.0	8.302	22	4 30 19.12	2.5487	18 09 57.2	3.119
23	2 33 01.02	+ 2.4212	N.13 35 37.6	+ 8.217	23	4 32 52.07	+ 2.5497	N.18 13 00.6	+ 2.993
	SATURDAY 18.					**MONDAY 20.**			
0	2 35 26.41	+ 2.4251	N.13 43 48.1	+ 8.132	0	4 35 25.08	+ 2.5507	N.18 15 56.4	+ 2.866
1	2 37 52.03	2.4288	13 51 53.5	8.047	1	4 37 58.15	2.5516	18 18 44.5	2.738
2	2 40 17.87	2.4326	13 59 53.7	7.960	2	4 40 31.27	2.5523	18 21 25.0	2.611
3	2 42 43.94	2.4363	14 07 48.7	7.872	3	4 43 04.43	2.5530	18 23 57.8	2.482
4	2 45 10.23	2.4400	14 15 38.3	7.782	4	4 45 37.63	2.5537	18 26 22.8	2.353
5	2 47 36.74	2.4437	14 23 22.5	7.691	5	4 48 10.87	2.5542	18 28 40.2	2.225
6	2 50 03.47	2.4473	14 31 01.2	7.599	6	4 50 44.14	2.5547	18 30 49.8	2.096
7	2 52 30.42	2.4510	14 38 34.4	7.506	7	4 53 17.43	2.5550	18 32 51.7	1.967
8	2 54 57.59	2.4546	14 46 01.9	7.411	8	4 55 50.74	2.5553	18 34 45.8	1.837
9	2 57 24.97	2.4581	14 53 23.7	7.316	9	4 58 24.07	2.5556	18 36 32.2	1.707
10	2 59 52.56	2.4616	15 00 39.8	7.219	10	5 00 57.41	2.5556	18 38 10.7	1.577
11	3 02 20.36	2.4650	15 07 50.0	7.122	11	5 03 30.74	2.5556	18 39 41.5	1.418
12	3 04 48.36	2.4684	15 14 54.4	7.023	12	5 06 04.08	2.5556	18 41 04.5	1.318
13	3 07 16.57	2.4718	15 21 52.8	6.923	13	5 08 37.41	2.5554	18 42 19.7	1.187
14	3 09 44.98	2.4751	15 28 45.2	6.822	14	5 11 10.73	2.5551	18 43 27.0	1.057
15	3 12 13.58	2.4783	15 35 31.4	6.720	15	5 13 44.02	2.5547	18 44 26.6	0.927
16	3 14 42.38	2.4816	15 42 11.6	6.617	16	5 16 17.30	2.5543	18 45 18.3	0.797
17	3 17 11.37	2.4847	15 48 45.5	6.512	17	5 18 50.54	2.5537	18 46 02.2	0.667
18	3 19 40.55	2.4879	15 55 13.1	6.407	18	5 21 23.75	2.5532	18 46 38.3	0.536
19	3 22 09.92	2.4910	16 01 34.3	6.301	19	5 23 56.93	2.5526	18 47 06.5	0.406
20	3 24 39.47	2.4940	16 07 49.2	6.194	20	5 26 30.06	2.5517	18 47 27.0	0.277
21	3 27 09.20	2.4969	16 13 57.6	6.086	21	5 29 03.13	2.5508	18 47 39.7	0.147
22	3 29 39.10	2.4997	16 19 59.5	5.977	22	5 31 36.16	2.5499	18 47 44.6	+ 0.016
23	3 32 09.17	2.5027	16 25 54.8	5.867	23	5 34 09.12	2.5488	18 47 41.6	- 0.114
24	3 34 39.42	+ 2.5055	N.16 31 43.5	+ 5.756	24	5 36 42.02	+ 2.5477	N.18 47 30.9	- 0.243

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 21.   THURSDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 36 42.02	+2.5477	N.18 47 30.9	−0.243	0	7 36 17.24	+2.4124	N.16 14 56.2	−5.861
1	5 39 14.85	2.5465	18 47 12.4	0.372	1	7 38 41.86	2.4084	16 09 01.6	5.960
2	5 41 47.60	2.5452	18 46 46.2	0.501	2	7 41 06.25	2.4044	16 03 01.0	6.057
3	5 44 20.28	2.5439	18 46 12.3	0.630	3	7 43 30.39	2.4004	15 56 54.7	6.152
4	5 46 52.87	2.5423	18 45 30.6	0.759	4	7 45 54.30	2.3964	15 50 42.7	6.247
5	5 49 25.36	2.5408	18 44 41.2	0.887	5	7 48 17.96	2.3923	15 44 25.0	6.342
6	5 51 57.77	2.5392	18 43 44.1	1.015	6	7 50 41.38	2.3882	15 38 01.6	6.436
7	5 54 30.07	2.5375	18 42 39.4	1.142	7	7 53 04.55	2.3842	15 31 32.7	6.527
8	5 57 02.27	2.5357	18 41 27.0	1.270	8	7 55 27.48	2.3801	15 24 58.3	6.618
9	5 59 34.36	2.5338	18 40 07.0	1.397	9	7 57 50.16	2.3759	15 18 18.5	6.708
10	6 02 06.33	2.5318	18 38 39.3	1.524	10	8 00 12.59	2.3717	15 11 33.3	6.797
11	6 04 38.18	2.5298	18 37 04.1	1.650	11	8 02 34.77	2.3677	15 04 42.8	6.886
12	6 07 09.91	2.5277	18 35 21.3	1.776	12	8 04 56.71	2.3636	14 57 47.0	6.973
13	6 09 41.51	2.5256	18 33 31.0	1.901	13	8 07 18.40	2.3593	14 50 46.0	7.058
14	6 12 12.98	2.5234	18 31 33.2	2.026	14	8 09 39.83	2.3552	14 43 40.0	7.143
15	6 14 44.32	2.5211	18 29 27.9	2.150	15	8 12 01.02	2.3511	14 36 28.8	7.228
16	6 17 15.51	2.5186	18 27 15.2	2.273	16	8 14 21.96	2.3469	14 29 12.6	7.311
17	6 19 46.55	2.5162	18 24 55.1	2.397	17	8 16 42.65	2.3427	14 21 51.5	7.392
18	6 22 17.45	2.5137	18 22 27.6	2.520	18	8 19 03.08	2.3385	14 14 25.5	7.473
19	6 24 48.20	2.5111	18 19 52.7	2.642	19	8 21 23.27	2.3344	14 06 54.7	7.552
20	6 27 18.78	2.5084	18 17 10.6	2.763	20	8 23 43.21	2.3302	13 59 19.2	7.632
21	6 29 49.21	2.5057	18 14 21.2	2.884	21	8 26 02.90	2.3262	13 51 38.9	7.710
22	6 32 19.47	2.5028	18 11 24.5	3.005	22	8 28 22.35	2.3220	13 43 54.0	7.787
23	6 34 49.55	+2.5000	N.18 08 20.6	−3.124	23	8 30 41.54	+2.3178	N.13 36 04.5	−7.862

WEDNESDAY 22.   FRIDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 37 19.47	+2.4972	N.18 05 09.6	−3.242	0	8 33 00.49	+2.3137	N.13 28 10.6	−7.936
1	6 39 49.21	2.4942	18 01 51.5	3.361	1	8 35 19.19	2.3095	13 20 12.2	8.009
2	6 42 18.77	2.4911	17 58 26.3	3.479	2	8 37 37.63	2.3053	13 12 09.5	8.082
3	6 44 48.14	2.4879	17 54 54.0	3.596	3	8 39 55.83	2.3013	13 04 02.4	8.153
4	6 47 17.32	2.4848	17 51 14.8	3.711	4	8 42 13.79	2.2972	12 55 51.1	8.223
5	6 49 46.32	2.4817	17 47 28.7	3.827	5	8 44 31.50	2.2932	12 47 35.6	8.292
6	6 52 15.12	2.4783	17 43 35.6	3.942	6	8 46 48.97	2.2891	12 39 16.0	8.361
7	6 54 43.72	2.4750	17 39 35.7	4.056	7	8 49 06.19	2.2850	12 30 52.3	8.428
8	6 57 12.12	2.4717	17 35 28.9	4.169	8	8 51 23.17	2.2809	12 22 24.6	8.493
9	6 59 40.32	2.4683	17 31 15.4	4.281	9	8 53 39.90	2.2769	12 13 53.1	8.558
10	7 02 08.32	2.4649	17 26 55.2	4.392	10	8 55 56.40	2.2729	12 05 17.6	8.623
11	7 04 36.11	2.4613	17 22 28.3	4.502	11	8 58 12.65	2.2689	11 56 38.3	8.686
12	7 07 03.68	2.4577	17 17 54.9	4.612	12	9 00 28.67	2.2650	11 47 55.3	8.747
13	7 09 31.04	2.4542	17 13 14.9	4.722	13	9 02 44.45	2.2611	11 39 08.6	8.808
14	7 11 58.18	2.4506	17 08 28.3	4.830	14	9 05 00.00	2.2572	11 30 18.3	8.867
15	7 14 25.11	2.4469	17 03 35.3	4.937	15	9 07 15.31	2.2532	11 21 24.5	8.926
16	7 16 51.81	2.4432	16 58 35.8	5.044	16	9 09 30.38	2.2493	11 12 27.2	8.983
17	7 19 18.29	2.4395	16 53 30.0	5.149	17	9 11 45.23	2.2455	11 03 26.5	9.040
18	7 21 44.55	2.4357	16 48 17.9	5.253	18	9 13 59.84	2.2417	10 54 22.4	9.096
19	7 24 10.57	2.4318	16 42 59.6	5.357	19	9 16 14.23	2.2379	10 45 15.0	9.150
20	7 26 36.37	2.4281	16 37 35.1	5.460	20	9 18 28.39	2.2341	10 36 04.4	9.203
21	7 29 01.94	2.4242	16 32 04.4	5.562	21	9 20 42.32	2.2303	10 26 50.6	9.257
22	7 31 27.27	2.4202	16 26 27.6	5.662	22	9 22 56.03	2.2266	10 17 33.6	9.308
23	7 33 52.37	2.4164	16 20 44.9	5.762	23	9 25 09.51	2.2229	10 08 13.7	9.357
24	7 36 17.24	+2.4124	N.16 14 56.2	−5.861	24	9 27 22.78	+2.2193	N. 9 58 50.8	−9.406

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 25.					**MONDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 27 22.78	+2.2193	N. 9 58 50.8	- 9.406	0	11 10 21.84	+2.0869	N. 1 49 48.9	-10.597
1	9 29 35.83	2.2157	9 49 25.0	9.455	1	11 12 27.00	2.0852	1 39 13.0	10.599
2	9 31 48.66	2.2120	9 39 56.2	9.502	2	11 14 32.06	2.0834	1 28 37.0	10.600
3	9 34 01.27	2.2084	9 30 24.7	9.547	3	11 16 37.01	2.0817	1 18 01.0	10.600
4	9 36 13.67	2.2049	9 20 50.5	9.592	4	11 18 41.87	2.0802	1 07 25.0	10.599
5	9 38 25.86	2.2014	9 11 13.6	9.637	5	11 20 46.63	2.0785	0 56 49.1	10.597
6	9 40 37.84	2.1980	9 01 34.1	9.680	6	11 22 51.29	2.0769	0 46 13.3	10.595
7	9 42 49.62	2.1946	8 51 52.0	9.722	7	11 24 55.86	2.0754	0 35 37.7	10.592
8	9 45 01.19	2.1912	8 42 07.5	9.762	8	11 27 00.34	2.0739	0 25 02.3	10.587
9	9 47 12.56	2.1877	8 32 20.5	9.802	9	11 29 04.73	2.0725	0 14 27.2	10.582
10	9 49 23.72	2.1844	8 22 31.2	9.842	10	11 31 09.04	2.0711	N. 0 03 52.5	10.576
11	9 51 34.69	2.1812	8 12 39.5	9.879	11	11 33 13.26	2.0697	S. 0 06 41.9	10.569
12	9 53 45.46	2.1778	8 02 45.7	9.916	12	11 35 17.41	2.0685	0 17 15.8	10.561
13	9 55 56.03	2.1747	7 52 49.6	9.952	13	11 37 21.48	2.0672	0 27 49.2	10.552
14	9 58 06.42	2.1715	7 42 51.4	9.987	14	11 39 25.47	2.0660	0 38 22.0	10.542
15	10 00 16.61	2.1682	7 32 51.2	10.021	15	11 41 29.40	2.0648	0 48 54.3	10.532
16	10 02 26.61	2.1652	7 22 48.9	10.054	16	11 43 33.25	2.0636	0 59 25.9	10.521
17	10 04 36.43	2.1622	7 12 44.7	10.086	17	11 45 37.03	2.0625	1 09 56.8	10.508
18	10 06 46.07	2.1591	7 02 38.6	10.117	18	11 47 40.75	2.0615	1 20 26.9	10.496
19	10 08 55.52	2.1561	6 52 30.7	10.147	19	11 49 44.41	2.0605	1 30 56.3	10.482
20	10 11 04.80	2.1532	6 42 21.0	10.175	20	11 51 48.01	2.0594	1 41 24.8	10.467
21	10 13 13.90	2.1502	6 32 09.7	10.202	21	11 53 51.54	2.0584	1 51 52.4	10.452
22	10 15 22.82	2.1473	6 21 56.7	10.230	22	11 55 55.02	2.0576	2 02 19.1	10.437
23	10 17 31.58	+2.1445	N. 6 11 42.1	-10.256	23	11 57 58.45	+2.0567	S. 2 12 44.8	-10.419
	SUNDAY 26.					**TUESDAY 28.**			
0	10 19 40.16	+2.1417	N. 6 01 26.0	-10.281	0	12 00 01.82	+2.0557	S. 2 23 09.4	-10.401
1	10 21 48.58	2.1389	5 51 08.4	10.305	1	12 02 05.14	2.0550	2 33 32.9	10.382
2	10 23 56.83	2.1362	5 40 49.4	10.327	2	12 04 08.42	2.0542	2 43 55.3	10.364
3	10 26 04.92	2.1335	5 30 29.1	10.350	3	12 06 11.65	2.0535	2 54 16.6	10.343
4	10 28 12.85	2.1308	5 20 07.4	10.372	4	12 08 14.84	2.0528	3 04 36.5	10.322
5	10 30 20.62	2.1282	5 09 44.5	10.392	5	12 10 17.99	2.0522	3 14 55.2	10.301
6	10 32 28.24	2.1257	4 59 20.4	10.411	6	12 12 21.10	2.0515	3 25 12.6	10.277
7	10 34 35.71	2.1232	4 48 55.2	10.428	7	12 14 24.17	2.0509	3 35 28.5	10.253
8	10 36 43.03	2.1207	4 38 29.0	10.446	8	12 16 27.21	2.0503	3 45 43.0	10.230
9	10 38 50.20	2.1183	4 28 01.7	10.463	9	12 18 30.21	2.0498	3 55 56.1	10.205
10	10 40 57.23	2.1160	4 17 33.4	10.478	10	12 20 33.19	2.0493	4 06 07.6	10.178
11	10 43 04.12	2.1137	4 07 04.3	10.493	11	12 22 36.13	2.0488	4 16 17.5	10.152
12	10 45 10.87	2.1113	3 56 34.3	10.507	12	12 24 39.05	2.0484	4 26 25.8	10.125
13	10 47 17.48	2.1090	3 46 03.5	10.518	13	12 26 41.94	2.0481	4 36 32.5	10.097
14	10 49 23.95	2.1067	3 35 32.1	10.530	14	12 28 44.82	2.0477	4 46 37.4	10.067
15	10 51 30.29	2.1047	3 24 59.9	10.542	15	12 30 47.67	2.0473	4 56 40.6	10.038
16	10 53 36.51	2.1025	3 14 27.1	10.552	16	12 32 50.50	2.0471	5 06 42.0	10.007
17	10 55 42.59	2.1003	3 03 53.7	10.560	17	12 34 53.32	2.0468	5 16 41.5	9.976
18	10 57 48.55	2.0983	2 53 19.9	10.568	18	12 36 56.12	2.0465	5 26 39.1	9.944
19	10 59 54.39	2.0963	2 42 45.5	10.576	19	12 38 58.90	2.0463	5 36 34.8	9.912
20	11 02 00.11	2.0943	2 32 10.8	10.582	20	12 41 01.68	2.0462	5 46 28.5	9.878
21	11 04 05.71	2.0924	2 21 35.7	10.587	21	12 43 04.45	2.0461	5 56 20.2	9.844
22	11 06 11.20	2.0905	2 11 00.3	10.592	22	12 45 07.21	2.0459	6 06 09.8	9.808
23	11 08 16.57	2.0887	2 00 24.7	10.595	23	12 47 09.96	2.0457	6 15 57.2	9.772
24	11 10 21.84	+2.0869	N. 1 49 48.9	-10.597	24	12 49 12.70	+2.0457	S. 6 25 42.5	-9.737

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 29.					**FRIDAY 31.**			
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 49 12.70	+2.0457	S. 6 25 42.5	−9.737	0	14 27 45.61	+2.0665	S.13 18 01.5	−7.199
1	12 51 15.44	2.0457	6 35 15.6	9.699	1	14 29 49.62	2.0671	13 25 11.5	7.132
2	12 53 18.19	2.0457	6 45 06.4	9.662	2	14 31 53.66	2.0677	13 32 17.4	7.064
3	12 55 20.93	2.0457	6 54 45.0	9.623	3	14 33 57.75	2.0685	13 39 19.2	6.995
4	12 57 23.68	2.0458	7 04 21.2	9.583	4	14 36 01.88	2.0692	13 46 16.8	6.927
5	12 59 26.43	2.0459	7 13 55.0	9.543	5	14 38 06.06	2.0700	13 53 10.4	6.857
6	13 01 29.19	2.0460	7 23 26.4	9.503	6	14 40 10.28	2.0707	13 59 59.7	6.787
7	13 03 31.95	2.0461	7 32 55.3	9.462	7	14 42 14.54	2.0713	14 06 44.9	6.717
8	13 05 34.72	2.0462	7 42 21.8	9.419	8	14 44 18.84	2.0720	14 13 25.8	6.646
9	13 07 37.50	2.0464	7 51 45.6	9.376	9	14 46 23.18	2.0727	14 20 02.4	6.575
10	13 09 40.29	2.0467	8 01 06.9	9.332	10	14 48 27.56	2.0733	14 26 34.8	6.503
11	13 11 43.10	2.0469	8 10 25.5	9.288	11	14 50 31.98	2.0741	14 33 02.8	6.431
12	13 13 45.92	2.0471	8 19 41.5	9.243	12	14 52 36.45	2.0748	14 39 26.5	6.358
13	13 15 48.75	2.0473	8 28 54.7	9.198	13	14 54 40.96	2.0755	14 45 45.8	6.285
14	13 17 51.60	2.0477	8 38 05.2	9.152	14	14 56 45.51	2.0762	14 52 00.7	6.212
15	13 19 54.47	2.0480	8 47 12.9	9.104	15	14 58 50.10	2.0768	14 58 11.2	6.138
16	13 21 57.36	2.0482	8 56 17.7	9.057	16	15 00 54.73	2.0776	15 04 17.3	6.063
17	13 24 00.26	2.0486	9 05 19.7	9.008	17	15 02 59.41	2.0782	15 10 18.8	5.988
18	13 26 03.19	2.0490	9 14 18.7	8.959	18	15 05 04.12	2.0788	15 16 15.9	5.913
19	13 28 06.14	2.0494	9 23 14.8	8.909	19	15 07 08.87	2.0795	15 22 08.4	5.837
20	13 30 09.12	2.0498	9 32 07.8	8.858	20	15 09 13.66	2.0802	15 27 56.4	5.762
21	13 32 12.12	2.0502	9 40 57.8	8.808	21	15 11 18.49	2.0808	15 33 39.8	5.685
22	13 34 15.14	2.0507	9 49 44.8	8.757	22	15 13 23.36	2.0814	15 39 18.6	5.608
23	13 36 18.20	+2.0512	S. 9 58 28.6	−8.703	23	15 15 28.26	+2.0820	S.15 44 52.8	−5.532
	THURSDAY 30.					**SATURDAY, NOVEMBER 1.**			
0	13 38 21.28	+2.0516	S.10 07 09.2	−8.651	0	15 17 33.20	+2.0827	S.15 50 22.4	−5.454
1	13 40 24.39	2.0521	10 15 46.7	8.597					
2	13 42 27.53	2.0526	10 24 20.9	8.542					
3	13 44 30.70	2.0532	10 32 51.8	8.487					
4	13 46 33.91	2.0537	10 41 19.4	8.432					
5	13 48 37.14	2.0542	10 49 43.7	8.377					
6	13 50 40.41	2.0547	10 58 04.6	8.320					
7	13 52 43.71	2.0553	11 06 22.1	8.262					
8	13 54 47.05	2.0559	11 14 36.1	8.204					
9	13 56 50.42	2.0565	11 22 46.6	8.147					
10	13 58 53.83	2.0571	11 30 53.7	8.087					
11	14 00 57.27	2.0577	11 38 57.1	8.027					
12	14 03 00.75	2.0583	11 46 56.9	7.967					
13	14 05 04.27	2.0590	11 54 53.1	7.907					
14	14 07 07.83	2.0596	12 02 45.7	7.845					
15	14 09 11.42	2.0602	12 10 34.5	7.782					
16	14 11 15.06	2.0610	12 18 19.6	7.720					
17	14 13 18.74	2.0616	12 26 00.9	7.657					
18	14 15 22.45	2.0622	12 33 38.4	7.592					
19	14 17 26.21	2.0630	12 41 12.0	7.528					
20	14 19 30.01	2.0636	12 48 41.8	7.464					
21	14 21 33.84	2.0642	12 56 07.7	7.398					
22	14 23 37.72	2.0650	13 03 29.6	7.332					
23	14 25 41.64	2.0657	13 10 47.6	7.266					
24	14 27 45.61	+2.0665	S.13 18 01.5	−7.199					

PHASES OF THE MOON.

		d h m
● New Moon	. . . . Oct.	1 05 09.1
☽ First Quarter	. . . . .	9 05 21.1
○ Full Moon	. . . . . .	16 18 01.1
☾ Last Quarter	. . . . .	23 10 58.1
● New Moon	. . . . . .	30 20 13.6

		d h
☾ Apogee	. . . . . . Oct.	7 18.4
☾ Perigee	. . . .	19 13.9

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
2	Sun	W.	9 25 38	3098	10 53 50	3101	12 21 59	3105	13 50 02	3112
	Saturn	E.	93 27 34	2725	91 51 27	2737	90 15 36	2748	88 40 00	2760
	a Aquilæ	E.	101 21 24	3113	99 53 30	3119	98 25 44	3128	96 58 08	3136
	Jupiter	E.	109 39 04	2728	108 03 01	2738	106 27 11	2749	104 51 36	2760
3	Sun	W.	21 07 57	3158	22 34 56	3170	24 01 41	3180	25 28 14	3191
	Saturn	E.	80 45 50	2818	79 11 46	2831	77 37 58	2842	76 04 25	2854
	a Aquilæ	E.	89 43 00	3189	88 16 38	3202	86 50 31	3214	85 24 38	3227
	Jupiter	E.	96 57 27	2818	95 23 23	2830	93 49 34	2841	92 15 59	2852
4	Sun ·	W.	32 37 35	3248	34 02 47	3260	35 27 45	3270	36 52 31	3282
	Saturn	E.	68 20 23	2912	66 48 19	2923	65 16 29	2934	63 44 53	2944
	a Aquilæ	E.	78 19 16	3299	76 55 03	3315	75 31 09	3332	74 07 34	3348
	Jupiter	E.	84 31 43	2909	82 59 35	2920	81 27 41	2931	79 56 00	2941
	Fomalhaut	E.	108 49 17	3372	107 26 29	3376	106 03 45	3379	104 41 05	3384
5	Sun	W.	43 53 15	3333	45 16 48	3342	46 40 11	3351	48 03 24	3360
	Saturn	E.	56 10 17	2997	54 40 01	3007	53 09 57	3017	51 40 05	3027
	a Aquilæ	E.	67 14 39	3440	65 53 08	3461	64 32 00	3481	63 11 15	3503
	Jupiter	E.	72 20 55	2992	70 50 32	3001	69 20 20	3009	67 50 19	3019
	Fomalhaut	E.	97 48 59	3408	96 26 52	3415	95 04 52	3421	93 42 59	3427
	a Pegasi	E.	114 22 00	3181	112 55 28	3186	111 29 02	3189	110 02 40	3194
6	Sun	W.	54 57 00	3400	56 19 17	3406	57 41 27	3412	59 03 30	3418
	Saturn	E.	44 13 44	3073	42 45 01	3082	41 16 29	3090	39 48 07	3099
	a Aquilæ	E.	56 33 51	3626	55 15 45	3655	53 58 10	3686	52 41 08	3718
	Jupiter	E.	60 22 58	3060	58 54 00	3068	57 25 11	3075	55 56 31	3082
	Fomalhaut	E.	86 55 32	3464	85 34 28	3473	84 13 34	3481	82 52 49	3489
	a Pegasi	E.	102 52 09	3215	101 26 18	3220	100 00 33	3224	98 34 52	3227
7	Sun	W.	65 52 12	3441	67 13 42	3445	68 35 08	3447	69 56 31	3449
	Saturn	E.	32 28 57	3143	31 01 39	3153	29 34 33	3162	28 07 38	3173
	a Aquilæ	E.	46 25 02	3912	45 11 54	3958	43 59 33	4011	42 48 04	4067
	Jupiter	E.	48 35 09	3112	47 07 14	3118	45 39 26	3123	44 11 44	3127
	Fomalhaut	E.	76 11 26	3534	74 51 39	3545	73 32 04	3554	72 12 39	3564
	a Pegasi	E.	91 27 35	3246	90 02 20	3248	88 37 08	3252	87 12 00	3253
8	Sun	W.	76 43 01	3453	78 04 18	3453	79 25 35	3451	80 46 54	3448
	Antares	W.	24 22 56	3332	25 46 31	3306	27 10 36	3283	28 35 07	3262
	Jupiter	E.	36 54 38	3150	35 27 29	3155	34 00 26	3160	32 33 29	3165
	a Aquilæ	E.	37 06 06	4445	36 01 25	4548	34 58 15	4660	33 56 42	4789
	Fomalhaut	E.	65 38 30	3622	64 20 19	3634	63 02 21	3648	61 44 38	3662
	a Pegasi	E.	80 06 56	3263	78 42 01	3265	77 17 08	3265	75 52 16	3266
9	Sun	W.	87 34 15	3431	88 55 56	3426	90 17 43	3420	91 39 37	3415
	Antares	W.	35 43 10	3183	37 09 40	3169	38 36 26	3156	40 03 28	3144
	Fomalhaut	E.	55 20 15	3750	54 04 21	3773	52 48 51	3796	51 33 45	3823
	a Pegasi	E.	68 48 05	3268	67 23 16	3267	65 58 26	3268	64 33 37	3267
	a Arietis	E.	112 03 12	3147	110 35 59	3140	109 08 38	3133	107 41 09	3126
10	Sun	W.	98 30 59	3376	99 53 43	3366	101 16 38	3357	102 39 44	3347
	Antares	W.	47 22 13	3084	48 50 42	3073	50 19 25	3060	51 48 24	3047

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
2	Sun	W.	15 17 57	3119	16 45 44	3127	18 13 21	3138	19 40 45	3148
	Saturn	E.	87 04 39	2772	85 29 34	2783	83 54 44	2795	82 20 09	2807
	α Aquilæ	E.	95 30 42	3146	94 03 28	3156	92 36 26	3166	91 09 36	3178
	Jupiter	E.	103 16 16	2772	101 41 11	2784	100 06 22	2795	98 31 47	2806
3	Sun	W.	26 54 34	3204	28 20 39	3214	29 46 31	3225	31 12 10	3237
	Saturn	E.	74 31 07	2866	72 58 04	2877	71 25 16	2888	69 52 42	2900
	α Aquilæ	E.	83 59 01	3241	82 33 40	3254	81 08 35	3269	79 43 47	3283
	Jupiter	E.	90 42 39	2864	89 09 34	2875	87 36 43	2886	86 04 06	2897
4	Sun	W.	38 17 04	3292	39 41 25	3303	41 05 33	3313	42 29 30	3323
	Saturn	E.	62 13 30	2956	60 42 22	2966	59 11 27	2977	57 40 46	2987
	α Aquilæ	E.	72 44 18	3365	71 21 22	3384	69 58 47	3401	68 36 32	3421
	Jupiter	E.	78 24 33	2951	76 53 19	2962	75 22 19	2972	73 51 31	2981
	Fomalhaut	E.	103 18 30	3387	101 55 59	3392	100 33 33	3397	99 11 13	3402
5	Sun	W.	49 26 26	3369	50 49 18	3377	52 12 01	3385	53 34 35	3393
	Saturn	E.	50 10 26	3037	48 40 59	3046	47 11 43	3055	45 42 38	3064
	α Aquilæ	E.	61 50 54	3525	60 30 58	3549	59 11 28	3575	57 52 26	3599
	Jupiter	E.	66 20 30	3028	64 50 52	3036	63 21 24	3044	61 52 06	3052
	Fomalhaut	E.	92 21 13	3435	90 59 36	3441	89 38 06	3449	88 16 45	3456
	α Pegasi	E.	108 36 24	3198	107 10 13	3203	105 44 07	3206	104 18 05	3211
6	Sun	W.	60 25 26	3424	61 47 15	3429	63 08 59	3433	64 30 38	3438
	Saturn	E.	38 19 56	3108	36 51 56	3116	35 24 06	3124	33 56 26	3133
	α Aquilæ	E.	51 24 40	3751	50 08 47	3787	48 53 31	3825	47 38 55	3867
	Jupiter	E.	54 27 59	3088	52 59 35	3095	51 31 19	3101	50 03 10	3107
	Fomalhaut	E.	81 32 13	3498	80 11 47	3506	78 51 30	3515	77 31 23	3525
	α Pegasi	E.	97 09 15	3232	95 43 44	3236	94 18 17	3239	92 52 54	3242
7	Sun	W.	71 17 52	3451	72 39 11	3453	74 00 28	3453	75 21 45	3454
	Saturn	E.	26 40 57	3187	25 14 32	3199	23 48 22	3214	22 22 29	3230
	α Aquilæ	E.	41 37 30	4129	40 27 56	4198	39 19 28	4273	38 12 10	4353
	Jupiter	E.	42 44 07	3132	41 16 36	3137	39 49 11	3142	38 21 52	3146
	Fomalhaut	E.	70 53 25	3575	69 34 23	3586	68 15 33	3597	66 56 55	3609
	α Pegasi	E.	85 46 54	3256	84 21 51	3259	82 56 51	3260	81 31 53	3261
8	Sun	W.	82 08 16	3446	83 29 40	3444	84 51 07	3439	86 12 39	3436
	Antares	W.	30 00 03	3242	31 25 22	3226	32 51 00	3211	34 16 56	3196
	Jupiter	E.	31 06 38	3172	29 39 55	3178	28 13 19	3185	26 46 52	3193
	α Aquilæ	E.	32 56 57	4933	31 59 09	5098	31 03 30	5284	30 10 11	5498
	Fomalhaut	E.	60 27 10	3677	59 09 59	3693	57 53 05	3711	56 36 30	3730
	α Pegasi	E.	74 27 25	3266	73 02 34	3267	71 37 44	3267	70 12 54	3268
9	Sun	W.	93 01 37	3408	94 23 44	3400	95 46 00	3393	97 08 25	3385
	Antares	W.	41 30 44	3133	42 58 14	3120	44 25 59	3108	45 53 59	3096
	Fomalhaut	E.	50 19 07	3852	49 04 58	3883	47 51 21	3918	46 38 19	3956
	α Pegasi	E.	63 08 47	3267	61 43 57	3267	60 19 07	3268	58 54 18	3268
	α Arietis	E.	106 13 31	3119	104 45 45	3111	103 17 49	3103	101 49 43	3095
10	Sun	W.	104 03 02	3336	105 26 32	3325	106 50 14	3313	108 14 10	3301
	Antares	W.	53 17 38	3035	54 47 07	3022	56 16 52	3009	57 46 53	2997

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object	Noon.	P. L. of Diff.	IIIʰ.	P. L. of Diff.	VIʰ.	P. L. of Diff.	IXʰ.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	Fomalhaut E .	45 25 56	3999	44 14 15	4046	43 03 21	4099	41 53 18	4156
	a Pegasi E .	57 29 29	3268	56 04 40	3270	54 39 53	3271	53 15 08	3274
	a Arietis E .	100 21 27	3086	98 53 00	3077	97 24 22	3067	95 55 32	3058
11	Sun W.	109 38 20	3288	111 02 45	3276	112 27 24	3263	113 52 19	3248
	Antares W.	59 17 10	2983	60 47 44	2970	62 18 34	2955	63 49 43	2942
	a Pegasi E .	46 12 18	3297	44 48 03	3306	43 23 59	3317	42 00 07	3330
	a Arietis E .	88 28 15	3004	86 58 07	2992	85 27 44	2981	83 57 07	2968
	Aldebaran E .	121 45 15	2928	120 13 32	2916	118 41 33	2903	117 09 18	2890
12	Sun W.	121 01 06	3176	122 27 44	3160	123 54 41	3144	125 21 57	3128
	Antares W.	71 29 57	2869	73 02 56	2853	74 36 15	2838	76 09 53	2822
	a Aquilæ W.	30 20 57	4995	31 17 56	4787	32 17 43	4601	33 20 07	4436
	Saturn W.	28 22 51	2913	29 54 53	2891	31 27 23	2870	33 00 20	2850
	a Arietis E .	76 20 05	2905	74 47 52	2891	73 15 22	2878	71 42 35	2866
	Aldebaran E .	109 23 50	2822	107 49 51	2808	106 15 34	2793	104 40 57	2779
13	Antares W.	84 03 13	2743	85 38 56	2726	87 15 01	2710	88 51 27	2695
	Saturn W.	40 51 32	2753	42 27 01	2735	44 02 55	2716	45 39 14	2698
	a Aquilæ W.	39 04 54	3833	40 19 22	3744	41 35 23	3662	42 52 51	3586
	Jupiter W.	25 02 25	2839	26 36 02	2810	28 10 17	2783	29 45 07	2757
	a Arietis E .	63 54 26	2798	62 19 56	2786	60 45 10	2773	59 10 07	2760
	Aldebaran E .	96 42 53	2701	95 06 14	2685	93 29 14	2669	91 51 52	2653
14	Antares W.	95 58 59	2614	98 37 35	2599	100 16 32	2583	101 55 50	2567
	Saturn W.	53 46 50	2609	55 25 33	2592	57 04 39	2574	58 44 09	2558
	a Aquilæ W.	49 39 04	3283	51 03 35	3233	52 29 05	3188	53 55 29	3144
	Jupiter W.	37 47 24	2643	39 25 20	2623	41 03 44	2603	42 42 35	2584
	a Arietis E .	51 10 56	2705	49 34 23	2695	47 57 37	2687	46 20 40	2681
	Aldebaran E .	83 39 35	2572	82 00 01	2556	80 20 05	2540	78 39 47	2523
	Pollux E .	125 52 25	2714	124 16 04	2691	122 39 12	2570	121 01 52	2649
15	Antares W.	110 17 35	2494	111 58 57	2480	113 40 38	2467	115 22 38	2454
	Saturn W.	67 07 24	2476	68 49 11	2461	70 31 19	2445	72 13 49	2431
	a Aquilæ W.	61 19 38	2962	62 50 38	2932	64 22 16	2902	65 54 32	2874
	Jupiter W.	51 03 13	2494	52 44 35	2478	54 26 19	2461	56 08 27	2445
	Aldebaran E .	70 12 44	2445	68 30 14	2431	66 47 24	2417	65 04 13	2402
	Pollux E .	112 48 27	2554	111 08 29	2537	109 28 07	2520	107 47 22	2503
16	Saturn W.	80 51 25	2362	82 35 55	2349	84 20 43	2337	86 05 49	2325
	a Aquilæ W.	73 44 06	2759	75 19 31	2740	76 55 15	2722	78 31 26	2704
	Jupiter W.	64 44 29	2372	66 28 44	2359	68 13 17	2348	69 58 07	2335
	a Pegasi W.	26 54 57	3348	28 18 13	3226	29 43 51	3121	31 11 35	3030
	Aldebaran E .	56 23 14	2335	54 38 05	2322	52 52 37	2310	51 06 52	2299
	Pollux E .	99 18 01	2429	97 35 07	2415	95 51 54	2403	94 08 23	2391
17	Saturn W.	94 55 22	2273	96 42 01	2265	98 28 52	2256	100 15 56	2248
	a Aquilæ W.	86 37 33	2638	88 15 37	2628	89 53 54	2620	91 32 22	2612
	Jupiter W.	78 46 35	2281	80 33 03	2272	82 19 43	2263	84 06 37	2255
	a Pegasi W.	38 54 22	2719	40 30 37	2675	42 07 50	2638	43 45 54	2604
	Aldebaran E .	42 14 09	2248	40 26 53	2239	38 39 24	2231	36 51 43	2224
	Pollux E .	85 26 44	2339	83 41 41	2331	81 56 26	2323	80 11 00	2316

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	Fomalhaut E.	40 44 10	4222	39 36 05	4298	38 29 10	4381	37 23 32	4473
	a Pegasi E.	51 50 26	3276	50 25 47	3279	49 01 11	3284	47 36 41	3290
	a Arietis E.	94 26 31	3047	92 57 17	3037	91 27 50	3026	89 58 09	3015
11	Sun W.	115 17 31	3235	116 42 59	3220	118 08 44	3206	119 34 46	3191
	Antares W.	65 21 09	2927	66 52 53	2912	68 24 56	2898	69 57 17	2883
	a Pegasi E.	40 36 30	3346	39 13 12	3365	37 50 16	3388	36 27 46	3415
	a Arietis E.	82 26 14	2956	80 55 06	2943	79 23 42	2931	77 52 02	2917
	Aldebaran E.	115 36 46	2877	114 03 58	2864	112 30 53	2850	110 57 30	2837
12	Sun W.	126 49 33	3112	128 17 28	3095	129 45 44	3078	131 14 20	3060
	Antares W.	77 43 52	2807	79 18 11	2792	80 52 50	2775	82 27 51	2759
	a Aquilæ W.	34 24 56	4290	35 31 58	4158	36 41 04	4038	37 52 06	3931
	Saturn W.	34 33 43	2830	36 07 32	2810	37 41 47	2791	39 16 27	2772
	a Arietis E.	70 09 32	2852	68 36 11	2838	67 02 33	2825	65 28 38	2812
	Aldebaran E.	103 06 01	2763	101 30 45	2747	99 55 08	2732	98 19 11	2716
13	Antares W.	90 28 14	2678	92 05 23	2663	93 42 53	2646	95 20 45	2630
	Saturn W.	47 15 57	2680	48 53 04	2662	50 30 35	2643	52 08 31	2626
	a Aquilæ W.	44 11 41	3516	45 31 47	3451	46 53 06	3391	48 15 33	3335
	Jupiter W.	31 20 31	2732	32 56 29	2708	34 32 58	2686	36 09 57	2665
	a Arietis E.	57 34 47	2748	55 59 11	2738	54 23 21	2726	52 47 16	2715
	Aldebaran E.	90 14 09	2637	88 36 04	2620	86 57 36	2604	85 18 47	2588
14	Antares W.	103 35 30	2552	105 15 31	2538	106 55 52	2523	108 36 33	2508
	Saturn W.	60 24 02	2540	62 04 19	2525	63 44 58	2508	65 26 00	2492
	a Aquilæ W.	55 22 45	3104	56 50 50	3065	58 19 42	3029	59 49 19	2995
	Jupiter W.	44 21 52	2565	46 01 35	2547	47 41 43	2529	49 22 16	2512
	a Arietis E.	44 43 34	2674	43 06 19	2669	41 28 58	2666	39 51 33	2664
	Aldebaran E.	76 59 06	2508	75 18 04	2492	73 36 39	2476	71 54 52	2461
	Pollux E.	119 24 04	2630	117 45 50	2610	116 07 08	2591	114 28 00	2572
15	Antares W.	117 04 56	2441	118 47 32	2430	120 30 24	2419	122 13 32	2407
	Saturn W.	73 56 39	2417	75 39 50	2402	77 23 22	2388	79 07 14	2375
	a Aquilæ W.	67 27 24	2849	69 00 48	2825	70 34 44	2801	72 09 11	2779
	Jupiter W.	57 50 57	2430	59 33 49	2416	61 17 01	2401	63 00 35	2387
	Aldebaran E.	63 20 41	2387	61 46 48	2374	59 52 36	2360	58 08 04	2348
	Pollux E.	106 06 13	2487	104 24 42	2472	102 42 49	2457	101 00 35	2443
16	Saturn W.	87 51 12	2313	89 36 52	2303	91 22 47	2293	93 08 57	2283
	a Aquilæ W.	80 08 01	2689	81 44 56	2674	83 22 11	2660	84 59 44	2649
	Jupiter W.	71 43 15	2323	73 28 41	2312	75 14 23	2301	77 00 21	2290
	a Pegasi W.	32 41 11	2950	34 12 26	2881	35 45 09	2821	37 19 10	2766
	Aldebaran E.	49 20 51	2287	47 34 33	2277	45 48 00	2267	44 01 12	2257
	Pollux E.	92 24 35	2379	90 40 30	2368	88 56 09	2358	87 11 34	2348
17	Saturn W.	102 03 12	2241	103 50 38	2235	105 38 13	2229	107 25 58	2223
	a Aquilæ W.	93 11 01	2606	94 49 48	2601	96 28 42	2598	98 07 40	2595
	Jupiter W.	85 53 43	2247	87 41 00	2241	89 28 27	2234	91 16 04	2228
	a Pegasi W.	45 24 44	2573	47 04 16	2545	48 44 27	2520	50 25 12	2497
	Aldebaran E.	35 03 51	2217	33 15 49	2210	31 27 37	2205	29 39 17	2200
	Pollux E.	78 25 24	2310	76 39 39	2304	74 53 46	2300	73 07 46	2295

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
18	SATURN	W.	109 13 51	2218	111 01 52	2214	112 49 59	2210	114 38 12	2207
	a Aquilæ	W.	99 46 42	2594	101 25 45	2594	103 04 48	2596	104 43 49	2599
	JUPITER	W.	93 03 50	2223	94 51 43	2218	96 39 43	2214	98 27 50	2210
	a Pegasi	W.	52 06 29	2477	53 48 14	2460	55 30 24	2443	57 12 59	2428
	Aldebaran	E.	27 50 49	2196	26 02 16	2192	24 13 37	2189	22 24 53	2188
	Pollux	E.	71 21 39	2292	69 35 28	2290	67 49 14	2288	66 02 57	2288
19	a Aquilæ	W.	112 57 03	2639	114 35 05	2652	116 12 49	2668	117 50 12	2687
	JUPITER	W.	107 29 25	2202	109 17 50	2201	111 06 16	2202	112 54 41	2202
	a Pegasi	W.	65 50 17	2377	67 34 25	2371	69 18 42	2365	71 03 07	2360
	a Arietis	W.	22 46 14	2710	24 22 41	2649	26 00 40	2583	27 39 59	2533
	Pollux	E.	57 11 47	2299	55 25 46	2304	53 39 53	2311	51 54 09	2319
20	a Pegasi	W.	79 46 18	2353	81 31 00	2355	83 15 40	2356	85 00 18	2359
	a Arietis	W.	36 10 00	2393	37 53 45	2377	39 37 53	2365	41 22 18	2355
	Pollux	E.	43 09 08	2383	41 25 09	2403	39 41 38	2424	37 58 37	2448
	SUN	E.	136 06 38	2473	134 24 45	2475	132 42 57	2479	131 01 14	2482
21	a Pegasi	W.	93 42 09	2382	95 26 09	2389	97 09 59	2396	98 53 39	2405
	a Arietis	W.	50 06 57	2333	51 52 08	2333	53 37 20	2332	55 22 33	2333
	Aldebaran	W.	15 59 51	2225	17 47 41	2228	19 35 27	2231	21 23 09	2234
	SUN	E.	122 34 10	2508	120 53 08	2514	119 12 14	2520	117 31 28	2527
22	a Pegasi	W.	107 28 45	2455	109 11 02	2467	110 53 02	2480	112 34 44	2493
	a Arietis	W.	64 07 50	2349	65 52 38	2355	67 37 18	2360	69 21 52	2365
	Aldebaran	W.	30 20 07	2261	32 07 04	2268	33 53 51	2274	35 40 28	2281
	SUN	E.	109 10 09	2564	107 30 25	2573	105 50 53	2581	104 11 32	2589
23	a Arietis	W.	78 02 22	2399	79 45 58	2407	81 29 23	2415	83 12 37	2422
	Aldebaran	W.	44 30 49	2321	46 16 18	2329	48 01 35	2337	49 46 40	2346
	SUN	E.	95 57 42	2634	94 19 33	2643	92 41 37	2652	91 03 53	2662
24	a Arietis	W.	91 45 49	2466	93 27 50	2475	95 09 38	2485	96 51 13	2494
	Aldebaran	W.	58 28 57	2389	60 12 47	2398	61 56 24	2407	63 39 49	2416
	SUN	E.	82 58 24	2710	81 21 57	2719	79 45 42	2729	78 09 40	2738
25	a Arietis	W.	105 15 45	2513	106 55 58	2554	108 35 55	2564	110 15 39	2575
	Aldebaran	W.	72 13 45	2460	73 55 54	2469	75 37 51	2477	77 19 36	2486
	Pollux	W.	31 14 26	2817	32 48 32	2795	34 23 07	2776	35 58 06	2761
	SUN	E.	70 12 41	2786	68 37 55	2796	67 03 22	2805	65 29 01	2815
26	Aldebaran	W.	85 45 18	2530	87 25 50	2539	89 06 09	2547	90 46 17	2556
	Pollux	W.	43 56 45	2725	45 32 52	2722	47 09 03	2721	48 45 15	2720
	SUN	E.	57 40 23	2862	56 07 16	2872	54 34 21	2881	53 01 38	2891
27	Aldebaran	W.	99 03 58	2599	100 42 55	2607	102 21 40	2615	104 00 15	2624
	Pollux	W.	56 45 58	2732	58 21 56	2735	59 57 49	2739	61 33 37	2744
	SUN	E.	45 21 04	2938	43 49 33	2947	42 18 14	2956	40 47 06	2965
28	Aldebaran	W.	112 10 08	2667	113 47 32	2676	115 24 44	2684	117 01 45	2693
	Pollux	W.	69 30 55	2772	71 05 59	2779	72 40 55	2785	74 15 43	2792
	SUN	E.	33 14 24	3013	31 44 27	3022	30 14 42	3032	28 45 09	3042

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVᵸ.	P. L. of Diff.	XVIIIᵸ.	P. L. of Diff.	XXIᵸ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
18	SATURN	W.	116 26 29	2204	118 14 50	2202	120 03 14	2201	121 51 40	2200
	a Aquilæ	W.	106 22 45	2604	108 01 35	2610	109 40 16	2618	111 18 46	2628
	JUPITER	W.	100 16 02	2208	102 04 18	2205	103 52 38	2204	105 41 00	2202
	a Pegasi	W.	58 55 54	2416	60 39 06	2404	62 22 35	2393	64 06 20	2384
	Aldebaran	E.	20 36 08	2189	18 47 24	2190	16 58 42	2193	15 10 04	2196
	Pollux	E.	64 16 40	2288	62 30 23	2289	60 44 07	2291	58 57 54	2295
19	a Aquilæ	W.	119 27 10	2707	121 03 41	2729	122 39 42	2753	124 15 11	2780
	JUPITER	W.	114 43 05	2204	116 31 26	2206	118 19 44	2209	120 07 58	2212
	a Pegasi	W.	72 47 39	2357	74 32 15	2356	76 16 53	2354	78 01 35	2353
	a Arietis	W.	29 20 27	2492	31 01 51	2461	32 43 59	2435	34 26 44	2413
	Pollux	E.	50 08 37	2328	48 23 19	2339	46 38 16	2351	44 53 31	2366
20	a Pegasi	W.	86 44 52	2362	88 29 21	2366	90 13 44	2371	91 58 00	2376
	a Arietis	W.	43 06 57	2348	44 51 46	2343	46 36 42	2338	48 21 47	2334
	Pollux	E.	36 16 10	2477	34 34 24	2511	32 53 26	2549	31 13 21	2592
	SUN	E.	129 19 36	2487	127 38 04	2492	125 56 39	2497	124 15 21	2502
21	a Pegasi	W.	100 37 07	2414	102 20 22	2423	104 03 24	2433	105 46 12	2443
	a Arietis	W.	57 07 44	2336	58 52 51	2338	60 37 55	2341	62 22 55	2344
	Aldebaran	W.	23 10 47	2237	24 58 19	2242	26 45 44	2248	28 33 00	2254
	SUN	E.	115 50 52	2534	114 10 26	2541	112 30 10	2548	110 50 04	2556
22	a Pegasi	W.	114 16 07	2567	115 57 10	2522	117 37 53	2538	119 18 14	2554
	a Arietis	W.	71 06 17	2371	72 50 33	2378	74 34 39	2384	76 18 36	2392
	Aldebaran	W.	37 26 55	2289	39 13 11	2297	40 59 15	2304	42 45 08	2313
	SUN	E.	102 32 22	2598	100 53 24	2607	99 14 38	2615	97 36 04	2624
23	a Arietis	W.	84 55 40	2431	86 38 31	2440	88 21 09	2448	90 03 35	2457
	Aldebaran	W.	51 31 32	2355	53 16 12	2364	55 00 39	2372	56 44 54	2380
	SUN	E.	89 26 22	2671	87 49 03	2681	86 11 58	2690	84 35 05	2699
24	a Arietis	W.	98 32 35	2504	100 13 43	2514	101 54 37	2523	103 35 18	2533
	Aldebaran	W.	65 23 01	2424	67 06 01	2433	68 48 48	2442	70 31 23	2451
	SUN	E.	76 33 51	2748	74 58 15	2757	73 22 51	2767	71 47 40	2776
25	a Arietis	W.	111 55 08	2587	113 34 21	2598	115 13 19	2609	116 52 02	2620
	Aldebaran	W.	79 01 09	2495	80 42 30	2504	82 23 38	2512	84 04 34	2521
	Pollux	W.	37 33 25	2750	39 08 59	2740	40 44 46	2733	42 20 42	2728
	SUN	E.	63 54 53	2825	62 20 57	2835	60 47 14	2844	59 13 42	2853
26	Aldebaran	W.	92 26 13	2564	94 05 57	2573	95 45 29	2582	97 24 49	2590
	Pollux	W.	50 21 28	2722	51 57 39	2723	53 33 48	2725	55 09 55	2728
	SUN	E.	51 29 07	2901	49 56 49	2910	48 24 42	2919	46 52 47	2928
27	Aldebaran	W.	105 38 38	2633	107 16 49	2642	108 54 47	2651	110 32 33	2659
	Pollux	W.	63 09 19	2749	64 44 54	2755	66 20 21	2760	67 55 42	2766
	SUN	E.	39 16 10	2975	37 45 26	2985	36 14 54	2994	34 44 33	3003
28	Aldebaran	W.	118 38 34	2703	120 15 10	2712	121 51 34	2720	123 27 47	2729
	Pollux	W.	75 50 21	2799	77 24 50	2807	78 59 09	2815	80 33 18	2822
	SUN	E.	27 15 47	3052	25 46 38	3061	24 17 40	3070	22 48 54	3081

AT GRENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ' "	"	' "	s	m s	s
Sat.	1	14 23 00.35	+ 9.776	S. 14 13 17.0	− 48.49	16 08.31	66.77	16 17.97	0.079
SUN.	2	14 26 55.37	9.809	14 32 34.0	47.92	16 08.56	66.88	16 19.49	0.046
Mon.	3	14 30 51.19	9.843	14 51 37.0	47.32	16 08.81	66.99	16 20.22	0.013
Tues.	4	14 34 47.82	+ 9.876	15 10 25.6	− 46.71	16 09.05	67.11	16 20.16	0.020
Wed.	5	14 38 45.25	9.910	15 28 59.1	46.08	16 09.30	67.23	16 19.27	0.054
Thur.	6	14 42 43.50	9.944	15 47 17.3	45.43	16 09.54	67.35	16 17.59	0.088
Frid.	7	14 46 42.56	+ 9.978	16 05 19.7	− 44.76	16 09.78	67.47	16 15.09	0.122
Sat.	8	14 50 42.44	10.012	16 23 05.9	44.08	16 10.01	67.59	16 11.78	0.156
SUN.	9	14 54 43.14	10.047	16 40 35.5	43.38	16 10.24	67.71	16 07.63	0.190
Mon.	10	14 58 44.68	+ 10.081	16 57 48.1	− 42.66	16 10.47	67.83	16 02.67	0.224
Tues.	11	15 02 47.03	10.116	17 14 43.4	41.93	16 10.69	67.95	15 56.89	0.259
Wed.	12	15 06 50.23	10.151	17 31 20.9	41.18	16 10.91	68.07	15 50.27	0.294
Thur.	13	15 10 54.26	+ 10.186	17 47 40.3	− 40.42	16 11.14	68.19	15 42.81	0.329
Frid.	14	15 14 59.14	10.221	18 03 41.1	39.64	16 11.36	68.31	15 34.50	0.364
Sat.	15	15 19 04.86	10.256	18 19 22.9	38.84	16 11.58	68.43	15 25.36	0.399
SUN.	16	15 23 11.43	+ 10.291	18 34 45.4	− 38.02	16 11.79	68.55	15 15.37	0.434
Mon.	17	15 27 18.85	10.326	18 49 48.3	37.19	16 12.00	68.67	15 04.55	0.469
Tues.	18	15 31 27.11	10.362	19 04 31.0	36.35	16 12.20	68.78	14 52.88	0.505
Wed.	19	15 35 36.22	+ 10.397	19 18 53.3	− 35.49	16 12.40	68.90	14 40.34	0.540
Thur.	20	15 39 46.18	10.433	19 32 54.8	34.62	16 12.60	69.01	14 26.98	0.575
Frid.	21	15 43 56.99	10.468	19 46 35.1	33.73	16 12.80	69.12	14 12.76	0.610
Sat.	22	15 48 08.63	+ 10.502	19 59 53.9	− 32.82	16 12.99	69.23	13 57.73	0.644
SUN.	23	15 52 21.09	10.536	20 12 50.7	31.90	16 13.18	69.34	13 41.87	0.678
Mon.	24	15 56 34.36	10.569	20 25 25.2	30.96	16 13.36	69.44	13 25.20	0.711
Tues.	25	16 00 48.42	+ 10.602	20 37 37.3	− 30.00	16 13.54	69.55	13 07.74	0.744
Wed.	26	16 05 03.27	10.634	20 49 26.2	29.05	16 13.72	69.66	12 49.49	0.776
Thur.	27	16 09 18.88	10.666	21 00 51.9	28.07	16 13.90	69.76	12 30.49	0.807
Frid.	28	16 13 35.24	+ 10.696	21 11 53.9	− 27.08	16 14.07	69.86	12 10.75	0.838
Sat.	29	16 17 52.33	10.726	21 22 31.9	26.08	16 14.23	69.96	11 50.27	0.867
SUN.	30	16 22 10.11	10.755	21 32 45.6	25.06	16 14.39	70.05	11 29.11	0.896
Mon.	31	16 26 28.57	+ 10.783	S. 21 42 34.8	− 24.03	16 14.55	70.14	11 07.27	0.924

Note.—The mean time of semidiameter passing meridian may be found by subtracting 0.19ˢ from the sidereal time. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	14 23 03.01	+ 9.777	S. 14 13 30.2	− 48.49	16 17.99	+ 0.079	14 39 21.00
SUN.	2	14 26 58.05	9.810	14 32 47.1	47.91	16 19.50	0.046	14 43 17.55
Mon.	3	14 30 53.88	9.843	14 51 49.9	47.31	16 20.22	+ 0.013	14 47 14.10
Tues.	4	14 34 50.51	+ 9.876	15 10 38.3	− 46.70	16 20.15	− 0.020	14 51 10.66
Wed.	5	14 38 47.95	9.910	15 29 11.6	46.07	16 19.26	0.054	14 55 07.21
Thur.	6	14 42 46.20	9.944	15 47 29.6	45.42	16 17.57	0.088	14 59 03.77
Frid.	7	14 46 45.26	+ 9.978	16 05 31.8	− 44.75	16 15.06	− 0.122	15 03 00.32
Sat.	8	14 50 45.14	10.012	16 23 17.8	44.07	16 11.74	0.156	15 06 56.88
SUN.	9	14 54 45.84	10.046	16 40 47.2	43.37	16 07.59	0.190	15 10 53.43
Mon.	10	14 58 47.37	+ 10.081	16 57 59.6	− 42.65	16 02.61	− 0.224	15 14 49.98
Tues.	11	15 02 49.72	10.115	17 14 54.6	41.92	15 56.82	0.259	15 18 46.54
Wed.	12	15 06 52.91	10.150	17 31 31.8	41.17	15 50.19	0.294	15 22 43.10
Thur.	13	15 10 56.93	+ 10.185	17 47 50.9	− 40.41	15 42.72	− 0.329	15 26 39.65
Frid.	14	15 15 01.80	10.220	18 03 51.4	39.63	15 34.40	0.364	15 30 36.20
Sat.	15	15 19 07.50	10.255	18 19 32.9	38.83	15 25.26	0.399	15 34 32.76
SUN.	16	15 23 14.05	+ 10.290	18 34 55.1	− 38.01	15 15.26	− 0.434	15 38 29.31
Mon.	17	15 27 21.44	10.325	18 49 57.6	37.18	15 04.43	0.469	15 42 25.87
Tues.	18	15 31 29.68	10.361	19 04 40.0	36.34	14 52.75	0.505	15 46 22.43
Wed.	19	15 35 38.77	+ 10.396	19 19 02.0	− 35.48	14 40.21	− 0.540	15 50 18.98
Thur.	20	15 39 48.70	10.431	19 33 03.2	34.61	14 26.84	0.575	15 54 15.54
Frid.	21	15 43 59.47	10.466	19 46 43.1	33.72	14 12.62	0.610	15 58 12.09
Sat.	22	15 48 11.07	+ 10.500	20 00 01.6	− 32.81	13 57.58	− 0.644	16 02 08.65
SUN.	23	15 52 23.49	10.534	20 12 58.0	31.89	13 41.72	0.678	16 06 05.21
Mon.	24	15 56 36.72	10.568	20 25 32.2	30.95	13 25.04	0.711	16 10 01.76
Tues.	25	16 00 50.74	+ 10.601	20 37 43.9	− 30.00	13 07.58	− 0.744	16 13 58.32
Wed.	26	16 05 05.55	10.633	20 49 32.5	29.04	12 49.32	0.776	16 17 54.87
Thur.	27	16 09 21.11	10.664	21 00 57.8	28.06	12 30.32	0.807	16 21 51.43
Frid.	28	16 13 37.41	+ 10.694	21 11 59.4	− 27.07	12 10.58	− 0.838	16 25 47.99
Sat.	29	16 17 54.44	10.724	21 22 37.0	26.07	11 50.10	0.867	16 29 44.54
SUN.	30	16 22 12.16	10.753	21 32 50.4	25.05	11 28.94	0.896	16 33 41.10
Mon.	31	16 26 30.56	+ 10.780	S. 21 42 39.2	− 24.02	11 07.10	− 0.924	16 37 37.66

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,
+ 9.8565ˢ.
(Table III.)

		AT GREENWICH MEAN NOON.						
		THE SUN'S						
Day of the Month.	Day of the Year.	TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		λ	λ'					
		° ′ ″	′ ″	″	″			h m s
1	305	218 08 24.1	07 36.4	150.20	+ 0.26	9.996 6305	− 47.1	9 19 07.16
2	306	219 08 29.8	07 41.9	150.27	0.37	9.996 5176	46.9	9 15 11.25
3	307	220 08 37.2	07 49.2	150.34	0.46	9.996 4053	46.7	9 11 15.34
4	308	221 08 46.3	07 58.2	150.41	+ 0.51	9.996 2936	− 46.4	9 07 19.43
5	309	222 08 57.0	08 08.8	150.48	0.56	9.996 1825	46.1	9 03 23.52
6	310	223 09 09.3	08 21.0	150.55	0.58	9.996 0723	45.7	8 59 27.61
7	311	224 09 23.2	08 34.7	150.61	+ 0.56	9.995 9629	− 45.3	8 55 31.70
8	312	225 09 38.5	08 49.9	150.67	0.52	9.995 8546	44.8	8 51 35.80
9	313	226 09 55.4	09 06.6	150.73	0.43	9.995 7476	44.3	8 47 39.89
10	314	227 10 13.6	09 24.8	150.79	+ 0.34	9.995 6419	− 43.7	8 43 43.98
11	315	228 10 33.4	09 44.4	150.85	0.23	9.995 5376	43.1	8 39 48.07
12	316	229 10 54.5	10 05.4	150.91	+ 0.11	9.995 4350	42.4	8 35 52.16
13	317	230 11 17.1	10 27.9	150.97	− 0.04	9.995 3342	− 41.6	8 31 56.25
14	318	231 11 41.3	10 51.9	151.04	0.18	9.995 2354	40.8	8 28 00.34
15	319	232 12 06.9	11 17.4	151.11	0.32	9.995 1386	39.9	8 24 04.44
16	320	233 12 34.1	11 44.5	151.18	− 0.44	9.995 0439	− 39.0	8 20 08.53
17	321	234 13 03.0	12 13.2	151.24	0.55	9.994 9513	38.1	8 16 12.62
18	322	235 13 33.5	12 43.6	151.31	0.62	9.994 8609	37.2	8 12 16.71
19	323	236 14 05.8	13 15.8	151.38	− 0.65	9.994 7725	− 36.4	8 08 20.80
20	324	237 14 39.9	13 49.7	151.46	0.67	9.994 6860	35.6	8 04 24.89
21	325	238 15 15.7	14 25.4	151.53	0.65	9.994 6015	34.9	8 00 28.98
22	326	239 15 53.3	15 02.8	151.60	− 0.59	9.994 5186	− 34.2	7 56 33.07
23	327	240 16 32.6	15 42.0	151.67	0.52	9.994 4374	33.5	7 52 37.16
24	328	241 17 13.6	16 22.8	151.74	0.41	9.994 3577	32.9	7 48 41.25
25	329	242 17 56.3	17 05.3	151.81	− 0.31	9.994 2794	− 32.3	7 44 45.34
26	330	243 18 40.5	17 49.4	151.87	0.17	9.994 2024	31.7	7 40 49.42
27	331	244 19 26.2	18 34.9	151.93	− 0.05	9.994 1268	31.2	7 36 53.51
28	332	245 20 13.3	19 21.9	151.99	+ 0.07	9.994 0525	− 30.7	7 32 57.60
29	333	246 21 01.8	20 10.2	152.04	0.18	9.993 9794	30.2	7 29 01.69
30	334	247 21 51.5	20 59.8	152.09	0.28	9.993 9076	29.7	7 25 05.78
31	335	248 22 42.3	21 50.5	152.14	+ 0.34	9.993 8370	− 29.1	7 21 09.87

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' to the mean equinox of January 0.0 of the Besselian fictitious year.

Diff. for 1 Hour,
− 9 8296ˢ.
(Table II.)

GREENWICH MEAN TIME.								
THE MOON'S								
Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 57.9	14 54.9	54 49.3	− 0.93	54 38.5	− 0.85	0 39.5	+ 1.98	1.2
2	14 52.3	14 50.0	54 28.9	0.75	54 20.6	0.63	1 27.2	1.99	2.2
3	14 48.2	14 46.8	54 13.7	0.50	54 08.5	0.35	2 15.0	1.99	3.2
4	14 45.8	14 45.5	54 05.2	− 0.20	54 03.8	− 0.02	3 02.7	+ 1.98	4.2
5	14 45.7	14 46.5	54 04.6	+ 0.16	54 07.7	+ 0.35	3 49.9	1.95	5.2
6	14 48.0	14 50.2	54 13.2	0.56	54 21.2	0.77	4 36.5	1.93	6.2
7	14 53.0	14 56.6	54 31.7	+ 0.98	54 44.7	+ 1.19	5 22.4	+ 1.90	7.2
8	15 00.9	15 05.8	55 00.3	1.40	55 18.4	1.60	6 07.9	1.90	8.2
9	15 11.3	15 17.5	55 38.7	1.79	56 01.3	1.95	6 53.5	1.91	9.2
10	15 24.1	15 31.2	56 25.7	+ 2.10	56 51.7	+ 2.22	7 39.7	+ 1.95	10.2
11	15 38.6	15 46.2	57 18.9	2.30	57 46.9	2.34	8 27.2	2.02	11.2
12	15 53.9	16 01.4	58 14.9	2.32	58 42.6	2.26	9 16.8	2.12	12.2
13	16 08.7	16 15.5	59 09.2	+ 2.14	59 34.1	+ 1.97	10 09.2	+ 2.25	13.2
14	16 21.6	16 26.9	59 56.6	1.75	60 16.1	1.48	11 04.9	2.39	14.2
15	16 31.2	16 34.5	60 32.0	1.16	60 44.0	0.82	12 03.8	2.51	15.2
16	16 36.6	16 37.5	60 51.7	+ 0.46	60 54.9	+ 0.08	13 05.1	+ 2.57	16.2
17	16 37.2	16 35.7	60 53.7	− 0.27	60 48.3	− 0.61	14 07.1	2.57	17.2
18	16 33.1	16 29.6	60 38.9	0.93	60 26.1	1.19	15 08.0	2.49	18.2
19	16 25.3	16 20.3	60 10.3	− 1.42	59 52.0	− 1.60	16 06.4	+ 2.37	19.2
20	16 14.9	16 09.0	59 31.9	1.73	59 10.4	1.82	17 01.5	2.23	20.2
21	16 03.0	15 56.8	58 48.2	1.86	58 25.7	1.88	17 53.5	2.11	21.2
22	15 50.7	15 44.7	58 03.2	− 1.85	57 41.1	− 1.81	18 42.8	+ 2.01	22.2
23	15 38.8	15 33.2	57 19.7	1.75	56 59.1	1.67	19 30.2	1.95	23.2
24	15 27.9	15 22.8	56 39.5	1.59	56 21.0	1.50	20 16.8	1.92	24.2
25	15 18.1	15 13.7	56 03.6	− 1.40	55 47.4	− 1.30	21 02.5	+ 1.92	25.2
26	15 09.6	15 05.8	55 32.3	1.21	55 18.3	1.12	21 48.7	1.93	26.2
27	15 02.2	14 59.0	55 05.4	1.03	54 53.6	0.94	22 35.3	1.96	27.2
28	14 56.1	14 53.4	54 42.8	− 0.85	54 33.1	− 0.77	23 22.6	+ 1.98	28.2
29	14 51.1	14 49.0	54 24.4	0.68	54 16.8	0.59	�☌		29.2
30	14 47.2	14 45.8	54 10.2	0.49	54 04.9	0.39	0 10.3	1.99	0.4
31	14 44.6	14 43.9	54 00.8	− 0.28	53 58.1	− 0.17	0 58.1	+ 1.99	1.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 1.					MONDAY 3.			
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 17 33.20	+ 2.0827	S.15 50 22.4	− 5.454	0	16 57 56.89	+ 2.0935	S.18 37 21.6	− 1.428
1	15 19 38.18	2.0832	15 55 47.3	5.376	1	17 00 02.50	2.0933	18 38 44.7	1.341
2	15 21 43.19	2.0838	16 01 07.5	5.297	2	17 02 08.09	2.0930	18 40 02.5	1.253
3	15 23 48.24	2.0844	16 06 23.0	5.218	3	17 04 13.66	2.0927	18 41 15.1	1.166
4	15 25 53.32	2.0849	16 11 33.7	5.140	4	17 06 19.21	2.0923	18 42 22.4	1.078
5	15 27 58.43	2.0855	16 16 39.8	5.061	5	17 08 24.74	2.0920	18 43 24.5	0.992
6	15 30 03.58	2.0861	16 21 41.0	4.980	6	17 10 30.25	2.0917	18 44 21.4	0.904
7	15 32 08.76	2.0866	16 26 37.4	4.901	7	17 12 35.74	2.0913	18 45 13.0	0.817
8	15 34 13.97	2.0872	16 31 29.1	4.821	8	17 14 41.21	2.0909	18 45 59.4	0.729
9	15 36 19.22	2.0877	16 36 15.9	4.739	9	17 16 46.65	2.0905	18 46 40.5	0.642
10	15 38 24.49	2.0881	16 40 57.8	4.658	10	17 18 52.07	2.0901	18 47 16.5	0.556
11	15 40 29.79	2.0886	16 45 34.9	4.577	11	17 20 57.46	2.0895	18 47 47.2	0.468
12	15 42 35.12	2.0891	16 50 07.1	4.496	12	17 23 02.81	2.0890	18 48 12.7	0.381
13	15 44 40.48	2.0895	16 54 34.4	4.414	13	17 25 08.14	2.0886	18 48 32.9	0.293
14	15 46 45.86	2.0899	16 58 56.8	4.332	14	17 27 13.44	2.0881	18 48 47.9	0.207
15	15 48 51.27	2.0903	17 03 14.3	4.250	15	17 29 18.71	2.0875	18 48 57.7	0.120
16	15 50 56.70	2.0907	17 07 26.8	4.167	16	17 31 23.94	2.0869	18 49 02.3	− 0.032
17	15 53 02.16	2.0912	17 11 34.4	4.084	17	17 33 29.14	2.0863	18 49 01.6	+ 0.054
18	15 55 07.64	2.0915	17 15 36.9	4.001	18	17 35 34.30	2.0857	18 48 55.8	0.141
19	15 57 13.14	2.0918	17 19 34.5	3.918	19	17 37 39.43	2.0852	18 48 44.7	0.228
20	15 59 18.66	2.0922	17 23 27.1	3.834	20	17 39 44.52	2.0845	18 48 28.4	0.314
21	16 01 24.20	2.0925	17 27 14.6	3.750	21	17 41 49.57	2.0839	18 48 07.0	0.401
22	16 03 29.76	2.0928	17 30 57.1	3.667	22	17 43 54.59	2.0832	18 47 40.3	0.487
23	16 05 35.34	+ 2.0931	S.17 34 34.6	− 3.582	23	17 45 59.56	+ 2.0825	S.18 47 08.5	+ 0.574
	SUNDAY 2.					TUESDAY 4.			
0	16 07 40.93	+ 2.0933	S.17 38 06.9	− 3.497	0	17 48 04.49	+ 2.0818	S.18 46 31.4	+ 0.661
1	16 09 46.54	2.0936	17 41 34.2	3.413	1	17 50 09.38	2.0811	18 45 49.2	0.747
2	16 11 52.16	2.0937	17 44 56.5	3.328	2	17 52 14.22	2.0803	18 45 01.8	0.832
3	16 13 57.79	2.0940	17 48 13.6	3.243	3	17 54 19.02	2.0796	18 44 09.3	0.918
4	16 16 03.44	2.0942	17 51 25.7	3.158	4	17 56 23.77	2.0787	18 43 11.6	1.004
5	16 18 09.10	2.0943	17 54 32.6	3.072	5	17 58 28.47	2.0779	18 42 08.8	1.090
6	16 20 14.76	2.0945	17 57 34.4	2.987	6	18 00 33.12	2.0772	18 41 00.8	1.175
7	16 22 20.44	2.0947	18 00 31.1	2.902	7	18 02 37.73	2.0764	18 39 47.8	1.260
8	16 24 26.12	2.0947	18 03 22.6	2.816	8	18 04 42.29	2.0755	18 38 29.6	1.346
9	16 26 31.80	2.0947	18 06 09.0	2.730	9	18 06 46.79	2.0746	18 37 06.3	1.431
10	16 28 37.49	2.0948	18 08 50.2	2.644	10	18 08 51.24	2.0737	18 35 37.9	1.516
11	16 30 43.18	2.0949	18 11 26.3	2.558	11	18 10 55.64	2.0729	18 34 04.4	1.601
12	16 32 48.88	2.0950	18 13 57.2	2.472	12	18 12 59.99	2.0720	18 32 25.8	1.685
13	16 34 54.58	2.0949	18 16 22.9	2.385	13	18 15 04.28	2.0711	18 30 42.2	1.769
14	16 37 00.27	2.0949	18 18 43.4	2.297	14	18 17 08.52	2.0702	18 28 53.5	1.854
15	16 39 05.97	2.0949	18 20 58.6	2.211	15	18 19 12.70	2.0692	18 26 59.7	1.937
16	16 41 11.66	2.0947	18 23 08.7	2.125	16	18 21 16.83	2.0683	18 25 01.0	2.021
17	16 43 17.34	2.0947	18 25 13.6	2.037	17	18 23 20.90	2.0673	18 22 57.2	2.105
18	16 45 23.02	2.0946	18 27 13.2	1.951	18	18 25 24.91	2.0664	18 20 48.4	2.188
19	16 47 28.69	2.0944	18 29 07.7	1.864	19	18 27 28.87	2.0655	18 18 34.6	2.272
20	16 49 34.35	2.0943	18 30 56.9	1.777	20	18 29 32.77	2.0645	18 16 15.8	2.355
21	16 51 40.01	2.0942	18 32 40.9	1.690	21	18 31 36.61	2.0634	18 13 52.0	2.437
22	16 53 45.65	2.0939	18 34 19.7	1.603	22	18 33 40.38	2.0624	18 11 23.3	2.519
23	16 55 51.28	2.0937	18 35 53.3	1.516	23	18 35 44.10	2.0615	18 08 49.7	2.602
24	16 57 56.89	+ 2.0935	S.18 37 21.6	− 1.428	24	18 37 47.76	+ 2.0605	S.18 06 11.1	+ 2.684

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 5. / FRIDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 37 47.76	+2.0605	S.18 06 11.1	+2.684	0	20 15 29.86	+2.0125	S.14 27 45.6	+6.302
1	18 39 51.36	2.0594	18 03 27.6	2.767	1	20 17 30.59	2.0117	14 21 25.5	6.368
2	18 41 54.89	2.0583	18 00 39.1	2.848	2	20 19 31.27	2.0110	14 15 01.4	6.436
3	18 43 58.36	2.0573	17 57 45.8	2.929	3	20 21 31.91	2.0103	14 08 33.2	6.502
4	18 46 01.77	2.0562	17 54 47.6	3.011	4	20 23 32.51	2.0097	14 02 01.1	6.568
5	18 48 05.11	2.0552	17 51 44.5	3.092	5	20 25 33.07	2.0090	13 55 25.0	6.635
6	18 50 08.40	2.0542	17 48 36.6	3.172	6	20 27 33.59	2.0083	13 48 44.9	6.700
7	18 52 11.62	2.0532	17 45 23.9	3.252	7	20 29 34.07	2.0077	13 42 01.0	6.765
8	18 54 14.78	2.0521	17 42 06.3	3.333	8	20 31 34.51	2.0070	13 35 13.1	6.831
9	18 56 17.87	2.0510	17 38 43.9	3.412	9	20 33 34.91	2.0064	13 28 21.3	6.895
10	18 58 20.90	2.0499	17 35 16.8	3.492	10	20 35 35.28	2.0059	13 21 25.7	6.959
11	19 00 23.86	2.0488	17 31 44.8	3.572	11	20 37 35.62	2.0054	13 14 26.2	7.022
12	19 02 26.76	2.0478	17 28 08.2	3.650	12	20 39 35.93	2.0049	13 07 23.0	7.086
13	19 04 29.60	2.0467	17 24 26.8	3.730	13	20 41 36.21	2.0043	13 00 15.9	7.149
14	19 06 32.37	2.0456	17 20 40.6	3.809	14	20 43 36.45	2.0038	12 53 05.1	7.212
15	19 08 35.07	2.0445	17 16 49.7	3.887	15	20 45 36.67	2.0034	12 45 50.5	7.274
16	19 10 37.71	2.0435	17 12 54.1	3.965	16	20 47 36.86	2.0030	12 38 32.2	7 336
17	19 12 40.29	2.0424	17 08 53.9	4.042	17	20 49 37.03	2.0027	12 31 10.2	7.397
18	19 14 42.80	2.0412	17 04 49.0	4.121	18	20 51 37.18	2.0023	12 23 44.6	7.457
19	19 16 45.24	2.0402	17 00 39.4	4.198	19	20 53 37.31	2.0020	12 16 15.3	7.519
20	19 18 47.63	2.0392	16 56 25.2	4.275	20	20 55 37.42	2.0017	12 08 42.3	7.579
21	19 20 49.95	2.0381	16 52 06.4	4.351	21	20 57 37.51	2.0013	12 01 05.8	7.638
22	19 22 52.20	2.0370	16 47 43.1	4.427	22	20 59 37.58	2.0011	11 53 25.7	7.698
23	19 24 54.39	+2.0360	S.16 43 15.1	+4.504	23	21 01 37.64	+2.0009	S.11 45 42.0	+7.757

THURSDAY 6. / SATURDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 26 56.52	+2.0349	S.16 38 42.6	+4.579	0	21 03 37.69	+2.0007	S.11 37 54.8	+7.816
1	19 28 58.58	2.0339	16 34 05.6	4.655	1	21 05 37.73	2.0006	11 30 04.1	7.874
2	19 31 00.59	2.0329	16 29 24.0	4.730	2	21 07 37.76	2.0004	11 22 09.9	7.932
3	19 33 02.53	2.0317	16 24 38.0	4.805	3	21 09 37.78	2.0003	11 14 12.3	7.989
4	19 35 04.40	2.0307	16 19 47.4	4.880	4	21 11 37.80	2.0002	11 06 11.2	8.046
5	19 37 06.22	2.0297	16 14 52.4	4.953	5	21 13 37.81	2.0002	10 58 06.8	8.102
6	19 39 07.97	2.0287	16 09 53.0	5.027	6	21 15 37.83	2.0003	10 49 59.0	8.158
7	19 41 09.67	2.0277	16 04 49.2	5.101	7	21 17 37.85	2.0003	10 41 47.8	8.214
8	19 43 11.30	2.0267	15 59 40.9	5.175	8	21 19 37.87	2.0003	10 33 33.3	8.269
9	19 45 12.88	2.0257	15 54 28.2	5.247	9	21 21 37.89	2.0004	10 25 15.5	8.324
10	19 47 14.39	2.0247	15 49 11.2	5.320	10	21 23 37.92	2.0006	10 16 54.4	8.378
11	19 49 15.85	2.0238	15 43 49.8	5.392	11	21 25 37.96	2.0007	10 08 30.1	8.432
12	19 51 17.25	2.0228	15 38 24.1	5.464	12	21 27 38.01	2.0009	10 00 02.5	8.486
13	19 53 18.59	2.0219	15 32 54.1	5.536	13	21 29 38.07	2.0012	9 51 31.8	8.538
14	19 55 19.88	2.0210	15 27 19.8	5.607	14	21 31 38.15	2.0015	9 42 57.9	8.591
15	19 57 21.11	2.0201	15 21 41.2	5.678	15	21 33 38.25	2.0018	9 34 20.9	8.643
16	19 59 22.29	2.0192	15 15 58.4	5.748	16	21 35 38.37	2.0022	9 25 40.7	8.695
17	20 01 23.41	2.0182	15 10 11.4	5.818	17	21 37 38.51	2.0026	9 16 57.5	8.746
18	20 03 24.48	2.0174	15 04 20.2	5.888	18	21 39 38.68	2.0030	9 08 11.2	8.797
19	20 05 25.50	2.0166	14 58 24.8	5.958	19	21 41 38.87	2.0034	8 59 21.9	8.846
20	20 07 26.47	2.0157	14 52 25.2	6.027	20	21 43 39.09	2.0039	8 50 29.7	8.896
21	20 09 27.39	2.0149	14 46 21.5	6.097	21	21 45 39.34	2.0045	8 41 34.4	8.946
22	20 11 28.26	2.0142	14 40 13.6	6.165	22	21 47 39.63	2.0051	8 32 36.2	8.994
23	20 13 29.09	2.0133	14 34 01.7	6.233	23	21 49 39.95	2.0057	8 23 35.1	9.042
24	20 15 29.86	+2.0125	S.14 27 45.6	+6.302	24	21 51 40.31	+2.0063	S. 8 14 31.1	+9.090

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
	SUNDAY 9.					TUESDAY 11.			

SUNDAY 9. / **TUESDAY 11.**

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 51 40.31	+ 2.0063	S. 8 14 31.1	+ 9.090	0	23 29 34.20	+ 2.0907	S. 0 13 56.4	+ 10.687
1	21 53 40.71	2.0071	8 05 24.3	9.137	1	23 31 39.73	2.0936	S. 0 03 14.7	10.703
2	21 55 41.16	2.0078	7 56 14.6	9.185	2	23 33 45.43	2.0965	N. 0 07 28.0	10.718
3	21 57 41.65	2.0085	7 47 02.1	9.231	3	23 35 51.31	2.0996	0 18 11.5	10.732
4	21 59 42.18	2.0093	7 37 46.9	9.276	4	23 37 57.38	2.1027	0 28 55.9	10.746
5	22 01 42.77	2.0102	7 28 29.0	9.322	5	23 40 03.64	2.1058	0 39 41 0	10.758
6	22 03 43.41	2.0112	7 19 08.3	9.366	6	23 42 10.08	2.1090	0 50 26.9	10.770
7	22 05 44.11	2.0122	7 09 45.1	9.409	7	23 44 16.72	2.1122	1 01 13.4	10.781
8	22 07 44.87	2.0132	7 00 19.2	9.453	8	23 46 23.55	2.1154	1 12 00.6	10.791
9	22 09 45.69	2.0142	6 50 50.7	9.497	9	23 48 30.57	2.1187	1 22 48.3	10.799
10	22 11 46.57	2.0152	6 41 19.6	9.539	10	23 50 37.80	2.1222	1 33 36.5	10.807
11	22 13 47.51	2.0163	6 31 46.0	9.581	11	23 52 45.24	2.1257	1 44 25.2	10.814
12	22 15 48.53	2.0176	6 22 09.9	9.622	12	23 54 52.88	2.1291	1 55 14.2	10.820
13	22 17 49.62	2.0187	6 12 31.3	9.662	13	23 57 00.73	2.1326	2 06 03.6	10.826
14	22 19 50.78	2.0200	6 02 50.4	9.702	14	23 59 08.79	2.1362	2 16 53.3	10.831
15	22 21 52.02	2.0213	5 53 07.0	9.743	15	0 01 17.07	2.1397	2 27 43.3	10.834
16	22 23 53.34	2.0227	5 43 21.2	9.782	16	0 03 25.56	2.1434	2 38 33.4	10.836
17	22 25 54.74	2.0240	5 33 33.1	9.820	17	0 05 34.28	2.1472	2 49 23.6	10.837
18	22 27 56.22	2.0254	5 23 42.8	9.858	18	0 07 43.22	2.1509	3 00 13.8	10.837
19	22 29 57.79	2.0269	5 13 50.1	9.896	19	0 09 52.39	2.1547	3 11 04.0	10.837
20	22 31 59.45	2.0285	5 03 55.3	9.932	20	0 12 01.79	2.1586	3 21 54.2	10.835
21	22 34 01.21	2.0301	4 53 58.2	9.969	21	0 14 11.42	2.1624	3 32 44.2	10.832
22	22 36 03.06	2.0317	4 43 59.0	10.004	22	0 16 21.28	2.1663	3 43 34.0	10.828
23	22 38 05.01	+ 2.0333	S. 4 33 57.7	+ 10.038	23	0 18 31.38	+ 2.1703	N. 3 54 23.6	+ 10.824

MONDAY 10. / **WEDNESDAY 12.**

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 40 07.06	+ 2.0351	S. 4 23 54.4	+ 10.072	0	0 20 41.72	+ 2.1743	N. 4 05 12.9	+ 10.817
1	22 42 09.22	2.0368	4 13 49.0	10.107	1	0 22 52.30	2.1784	4 16 01.7	10.810
2	22 44 11.48	2.0386	4 03 41.6	10.140	2	0 25 03.13	2.1826	4 26 50.1	10.802
3	22 46 13.85	2.0405	3 53 32.2	10.172	3	0 27 14.21	2.1867	4 37 37.9	10.792
4	22 48 16.34	2.0424	3 43 20.9	10.203	4	0 29 25.53	2.1908	4 48 25.2	10.782
5	22 50 18.94	2.0443	3 33 07.8	10.235	5	0 31 37.11	2.1952	4 59 11.8	10.770
6	22 52 21.66	2.0463	3 22 52.7	10.266	6	0 33 48.95	2.1994	5 09 57.6	10.757
7	22 54 24.50	2.0483	3 12 35.9	10.295	7	0 36 01.04	2.2037	5 20 42.7	10.744
8	22 56 27.46	2.0505	3 02 17.3	10.323	8	0 38 13.40	2.2082	5 31 26.9	10.729
9	22 58 30.56	2.0527	2 51 57.1	10.352	9	0 40 26.02	2.2125	5 42 10.2	10.712
10	23 00 33.78	2.0548	2 41 35.1	10.380	10	0 42 38.90	2.2170	5 52 52.4	10.695
11	23 02 37.14	2.0571	2 31 11.5	10.407	11	0 44 52.06	2.2215	6 03 33.6	10.677
12	23 04 40.63	2.0593	2 20 46.3	10.432	12	0 47 05.48	2.2260	6 14 13.7	10.657
13	23 06 44.26	2.0617	2 10 19.6	10.458	13	0 49 19.18	2.2306	6 24 52.5	10.636
14	23 08 48.03	2.0641	1 59 51.3	10.483	14	0 51 33.15	2.2351	6 35 30.0	10.614
15	23 10 51.95	2.0665	1 49 21.6	10.507	15	0 53 47.39	2.2397	6 46 06.2	10.591
16	23 12 56.01	2.0690	1 38 50.5	10.529	16	0 56 01.92	2.2445	6 56 40.9	10.566
17	23 15 00.23	2.0716	1 28 18.1	10.552	17	0 58 16.73	2.2492	7 07 14.1	10.541
18	23 17 04.60	2.0741	1 17 44.3	10.574	18	1 00 31.82	2.2539	7 17 45.8	10.513
19	23 19 09.12	2.0767	1 07 09.2	10.595	19	1 02 47.20	2.2587	7 28 15.7	10.484
20	23 21 13.81	2.0794	0 56 32.9	10.615	20	1 05 02.86	2.2634	7 38 43.9	10.455
21	23 23 18.65	2.0822	0 45 55.4	10.634	21	1 07 18.81	2.2682	7 49 10.3	10.424
22	23 25 23.67	2.0850	0 35 16.8	10.652	22	1 09 35.05	2.2731	7 59 34.8	10.392
23	23 27 28.85	2.0877	0 24 37.1	10.670	23	1 11 51.58	2.2780	8 09 57.3	10.357
24	23 29 34.20	+ 2.0907	S. 0 13 56.4	+ 10.687	24	1 14 08.41	+ 2.2829	N. 8 20 17.7	+ 10.322

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
			THURSDAY 13.					**SATURDAY 15.**	
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 14 08.41	+ 2.2829	N. 8 20 17.7	+ 10.322	0	3 09 35.88	+ 2.5247	N.15 29 14.2	+ 7.006
1	1 16 25.53	2.2878	8 30 36.0	10.287	1	3 12 07.49	2.5291	15 36 11.5	6.903
2	1 18 42.95	2.2928	8 40 52.1	10.249	2	3 14 39.37	2.5336	15 43 02.6	6.798
3	1 21 00.67	2.2978	8 51 05.9	10.210	3	3 17 11.52	2.5379	15 49 47.3	6.692
4	1 23 18.69	2.3028	9 01 17.3	10.170	4	3 19 43.92	2.5422	15 56 25.7	6.586
5	1 25 37.01	2.3078	9 11 26.3	10.128	5	3 22 16.58	2.5463	16 02 57.6	6.477
6	1 27 55.63	2.3129	9 21 32.7	10.085	6	3 24 49.48	2.5505	16 09 23.0	6.367
7	1 30 14.56	2.3181	9 31 36.5	10.042	7	3 27 22.64	2.5547	16 15 41.7	6.257
8	1 32 33.80	2.3232	9 41 37.7	9.996	8	3 29 56.04	2.5587	16 21 53.8	6.146
9	1 34 53.34	2.3282	9 51 36.0	9.948	9	3 32 29.68	2.5626	16 27 59.2	6.032
10	1 37 13.19	2.3333	10 01 31.5	9.901	10	3 35 03.55	2.5665	16 33 57.7	5.918
11	1 39 33.34	2.3385	10 11 24.1	9.851	11	3 37 37.66	2.5703	16 39 49.4	5.803
12	1 41 53.81	2.3437	10 21 13.6	9.799	12	3 40 11.99	2.5740	16 45 34.1	5.687
13	1 44 14.59	2.3488	10 31 00.0	9.747	13	3 42 46.54	2.5777	16 51 11.8	5.569
14	1 46 35.67	2.3540	10 40 43.2	9.692	14	3 45 21.32	2.5813	16 56 42.4	5.450
15	1 48 57.07	2.3592	10 50 23.0	9.636	15	3 47 56.30	2.5847	17 02 05.8	5.330
16	1 51 18.77	2.3643	10 59 59.5	9.580	16	3 50 31.49	2.5882	17 07 22.0	5.209
17	1 53 40.79	2.3696	11 09 32.6	9.522	17	3 53 06.88	2.5915	17 12 30.9	5.088
18	1 56 03.12	2.3748	11 19 02.1	9.462	18	3 55 42.47	2.5947	17 17 32.6	4.966
19	1 58 25.77	2.3801	11 28 28.0	9.401	19	3 58 18.25	2.5978	17 22 26.8	4.841
20	2 00 48.73	2.3852	11 37 50.2	9.337	20	4 00 54.21	2.6009	17 27 13.5	4.717
21	2 03 12.00	2.3905	11 47 08.5	9.273	21	4 03 30.36	2.6039	17 31 52.8	4.592
22	2 05 35.59	2.3957	11 56 23.0	9.209	22	4 06 06.68	2.6068	17 36 24.5	4.465
23	2 07 59.48	+ 2.4008	N.12 05 33.6	+ 9.142	23	4 08 43.18	+ 2.6096	N.17 40 48.6	+ 4.337
			FRIDAY 14.					**SUNDAY 16.**	
0	2 10 23.69	+ 2.4061	N.12 14 40.0	+ 9.072	0	4 11 19.83	+ 2.6122	N.17 45 05.0	+ 4.209
1	2 12 48.21	2.4113	12 23 42.3	9.003	1	4 13 56.64	2.6148	17 49 13.7	4.081
2	2 15 13.05	2.4165	12 32 40.4	8.932	2	4 16 33.61	2.6173	17 53 14.7	3.951
3	2 17 38.19	2.4216	12 41 34.2	8.859	3	4 19 10.72	2.6197	17 57 07.8	3.820
4	2 20 03.64	2.4268	12 50 23 5	8.785	4	4 21 47.97	2.6219	18 00 53.1	3.690
5	2 22 29.41	2.4320	12 59 08.4	8.710	5	4 24 25.35	2.6240	18 04 30.6	3.558
6	2 24 55.48	2.4371	13 07 48.7	8.632	6	4 27 02.85	2.6261	18 08 00.1	3.425
7	2 27 21.86	2.4422	13 16 24.3	8.554	7	4 29 40.48	2.6282	18 11 21.6	3.292
8	2 29 48.55	2.4473	13 24 55.2	8.474	8	4 32 18.23	2.6300	18 14 35.1	3.158
9	2 32 15.54	2.4523	13 33 21.2	8.392	9	4 34 56.08	2.6317	18 17 40.6	3.024
10	2 34 42.83	2.4574	13 41 42.3	8.311	10	4 37 34.03	2.6333	18 20 38.0	2.888
11	2 37 10.43	2.4625	13 49 58.5	8.227	11	4 40 12.08	2.6348	18 23 27.2	2.752
12	2 39 38.33	2.4675	13 58 09.5	8.141	12	4 42 50.21	2.6362	18 26 08.3	2.617
13	2 42 06.53	2.4725	14 06 15.4	8.054	13	4 45 28.42	2.6375	18 28 41.3	2.481
14	2 44 35.03	2.4774	14 14 16.0	7.965	14	4 48 06.71	2.6387	18 31 06.0	2.343
15	2 47 03.82	2.4823	14 22 11.2	7.875	15	4 50 45.07	2.6397	18 33 22.5	2.207
16	2 49 32.91	2.4872	14 30 01.0	7.784	16	4 53 23.48	2.6407	18 35 30.8	2.069
17	2 52 02.29	2.4921	14 37 45.3	7.692	17	4 56 01.95	2.6416	18 37 30.8	1.931
18	2 54 31.96	2.4968	14 45 24.0	7.597	18	4 58 40.47	2.6422	18 39 22.5	1.792
19	2 57 01.91	2.5016	14 52 57.0	7.502	19	5 01 19.02	2.6428	18 41 05.9	1.654
20	2 59 32.15	2.5063	15 00 24.3	7.406	20	5 03 57.61	2.6433	18 42 41.0	1.515
21	3 02 02.67	2.5109	15 07 45.7	7.307	21	5 06 36.22	2.6437	18 44 07.7	1.376
22	3 04 33.46	2.5155	15 15 01.2	7.209	22	5 09 14.85	2.6439	18 45 26.1	1.237
23	3 07 04.53	2.5202	15 22 10.8	7.108	23	5 11 53.49	2.6441	18 46 36.1	1.097
24	3 09 35.88	+ 2.5247	N.15 29 14.2	+ 7.006	24	5 14 32.14	+ 2.6441	N.18 47 37.7	+ 0.957

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
MONDAY 17.					**WEDNESDAY 19.**				
0	5 14 32.14	+ 2.6441	N.18 47 37.7	+ 0.957	0	7 19 22.06	+ 2.5206	N.16 58 00.2	− 5.292
1	5 17 10.78	2.6439	18 48 31.0	0.818	1	7 21 53.16	2.5161	16 52 39.3	5.404
2	5 19 49.41	2.6437	18 49 15.9	0.678	2	7 24 23.99	2.5115	16 47 11.7	5.514
3	5 22 28.03	2.6434	18 49 52.4	0.539	3	7 26 54.54	2.5067	16 41 37.6	5.622
4	5 25 06.62	2.6428	18 50 20.6	0.399	4	7 29 24.80	2.5021	16 35 57.0	5.730
5	5 27 45.17	2.6423	18 50 40.3	0.259	5	7 31 54.79	2.4974	16 30 10.0	5.836
6	5 30 23.69	2.6417	18 50 51.7	+ 0.120	6	7 34 24.49	2.4925	16 24 16.7	5.942
7	5 33 02.17	2.6408	18 50 54.7	− 0.019	7	7 36 53.89	2.4877	16 18 17.0	6.046
8	5 35 40.59	2.6399	18 50 49.4	0.158	8	7 39 23.01	2.4828	16 12 11.2	6.148
9	5 38 18.96	2.6389	18 50 35.7	0.297	9	7 41 51.83	2.4779	16 05 59.2	6.250
10	5 40 57.26	2.6377	18 50 13.7	0.436	10	7 44 20.36	2.4730	15 59 41.2	6.351
11	5 43 35.48	2.6364	18 49 43.4	0.575	11	7 46 48.59	2.4680	15 53 17.1	6.450
12	5 46 13.63	2.6351	18 49 04.7	0.714	12	7 49 16.52	2.4630	15 46 47.2	6.547
13	5 48 51.69	2.6335	18 48 17.7	0.852	13	7 51 44.15	2.4580	15 40 11.4	6.644
14	5 51 29.65	2.6319	18 47 22.5	0.989	14	7 54 11.48	2.4529	15 33 29.9	6.740
15	5 54 07.52	2.6302	18 46 19.0	1.127	15	7 56 38.50	2.4477	15 26 42.6	6.835
16	5 56 45.27	2.6283	18 45 07.3	1.264	16	7 59 05.21	2.4427	15 19 49.7	6.927
17	5 59 22.92	2.6264	18 43 47.3	1.401	17	8 01 31.62	2.4377	15 12 51.3	7.019
18	6 02 00.44	2.6243	18 42 19.2	1.537	18	8 03 57.73	2.4325	15 05 47.4	7.111
19	6 04 37.84	2.6222	18 40 42.9	1.672	19	8 06 23.52	2.4273	14 58 38.0	7.201
20	6 07 15.11	2.6200	18 38 58.6	1.807	20	8 08 49.00	2.4222	14 51 23.3	7.288
21	6 09 52.24	2.6177	18 37 06.1	1.942	21	8 11 14.18	2.4170	14 44 03.4	7.375
22	6 12 29.23	2.6152	18 35 05.5	2.077	22	8 13 39.04	2.4117	14 36 38.3	7.462
23	6 15 06.06	+ 2.6126	N.18 32 56.9	− 2.210	23	8 16 03.59	+ 2.4066	N.14 29 08.0	− 7.547
TUESDAY 18.					**THURSDAY 20.**				
0	6 17 42.74	+ 2.6099	N.18 30 40.3	− 2.342	0	8 18 27.83	+ 2.4014	N.14 21 32.7	− 7.630
1	6 20 19.25	2.6072	18 28 15.8	2.475	1	8 20 51.76	2.3962	14 13 52.4	7.712
2	6 22 55.60	2.6043	18 25 43.3	2.607	2	8 23 15.38	2.3910	14 06 07.3	7.792
3	6 25 31.77	2.6013	18 23 02.9	2.737	3	8 25 38.68	2.3858	13 58 17.3	7.872
4	6 28 07.76	2.5983	18 20 14.8	2.867	4	8 28 01.68	2.3807	13 50 22.6	7.950
5	6 30 43.57	2.5952	18 17 18.8	2.998	5	8 30 24.36	2.3754	13 42 23.3	8.027
6	6 33 19.18	2.5919	18 14 15.0	3.127	6	8 32 46.73	2.3702	13 34 19.3	8.104
7	6 35 54.60	2.5887	18 11 03.6	3.254	7	8 35 08.78	2.3650	13 26 10.8	8.178
8	6 38 29.82	2.5852	18 07 44.5	3.382	8	8 37 30.53	2.3598	13 17 57.9	8.251
9	6 41 04.83	2.5817	18 04 17.8	3.508	9	8 39 51.96	2.3546	13 09 40.7	8.323
10	6 43 39.63	2.5782	18 00 43.5	3.634	10	8 42 13.08	2.3495	13 01 18.4	8.395
11	6 46 14.21	2.5745	17 57 01.7	3.759	11	8 44 33.90	2.3443	12 52 53.3	8.464
12	6 48 48.57	2.5707	17 53 12.4	3.883	12	8 46 54.40	2.3392	12 44 23.4	8.532
13	6 51 22.70	2.5670	17 49 15.7	4.006	13	8 49 14.60	2.3341	12 35 49.4	8.599
14	6 53 56.61	2.5632	17 45 11.7	4.127	14	8 51 34.49	2.3290	12 27 11.5	8.665
15	6 56 30.28	2.5592	17 41 00.4	4.248	15	8 53 54.08	2.3239	12 18 29.6	8.731
16	6 59 03.71	2.5551	17 36 41.9	4.369	16	8 56 13.36	2.3187	12 09 43.8	8.794
17	7 01 36.89	2.5510	17 32 16.1	4.488	17	8 58 32.33	2.3137	12 00 54.3	8.856
18	7 04 09.83	2.5469	17 27 43.3	4.606	18	9 00 51.00	2.3087	11 52 01.1	8.917
19	7 06 42.52	2.5427	17 23 03.4	4.723	19	9 03 09.38	2.3037	11 43 04.2	8.977
20	7 09 14.95	2.5384	17 18 16.5	4.840	20	9 05 27.45	2.2987	11 34 03.8	9.036
21	7 11 47.13	2.5341	17 13 22.6	4.955	21	9 07 45.22	2.2937	11 24 59.9	9.094
22	7 14 19.04	2.5297	17 08 21.9	5.068	22	9 10 02.70	2.2888	11 15 52.5	9.150
23	7 16 50.69	2.5252	17 03 14.4	5.181	23	9 12 19.88	2.2839	11 06 41.9	9.204
24	7 19 22.06	+ 2.5206	N.16 58 00.2	− 5.292	24	9 14 36.77	+ 2.2791	N.10 57 28.0	− 9.258

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 21.					**SUNDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 14 36.77	+ 2.2791	N.10 57 28.0	−9.258	0	10 59 08.18	+ 2.0937	N. 2 52 00.5	−10.574
1	9 16 53.37	2.2742	10 48 10.9	9.311	1	11 01 13.72	2.0910	2 41 25.9	10.578
2	9 19 09.68	2.2694	10 38 50.7	9.362	2	11 03 19.10	2.0884	2 30 51.1	10.581
3	9 21 25.70	2.2646	10 29 27.4	9.412	3	11 05 24.33	2.0859	2 20 16.2	10.582
4	9 23 41.43	2.2598	10 20 01.2	9.462	4	11 07 29.41	2.0833	2 09 41.2	10.583
5	9 25 56.88	2.2552	10 10 32.0	9.511	5	11 09 34.33	2.0808	1 59 06.2	10.583
6	9 28 12.05	2.2505	10 00 59.9	9.557	6	11 11 39.11	2.0785	1 48 31.2	10.583
7	9 30 26.94	2.2459	9 51 25.1	9.602	7	11 13 43.75	2.0761	1 37 56.2	10.582
8	9 32 41.56	2.2412	9 41 47.6	9.647	8	11 15 48.24	2.0738	1 27 21.4	10.579
9	9 34 55.89	2.2367	9 32 07.4	9.692	9	11 17 52.60	2.0716	1 16 46.7	10.576
10	9 37 09.96	2.2322	9 22 24.6	9.734	10	11 19 56.83	2.0693	1 06 12.3	10.572
11	9 39 23.75	2.2277	9 12 39.3	9.775	11	11 22 00.92	2.0671	0 55 38.1	10.567
12	9 41 37.28	2.2232	9 02 51.6	9.815	12	11 24 04.88	2.0650	0 45 04.2	10.562
13	9 43 50.54	2.2188	8 53 01.5	9.854	13	11 26 08.72	2.0630	0 34 30.7	10.555
14	9 46 03.54	2.2144	8 43 09.1	9.892	14	11 28 12.44	2.0611	0 23 57.6	10.548
15	9 48 16.27	2.2101	8 33 14.5	9.928	15	11 30 16.05	2.0591	0 13 24.9	10.541
16	9 50 28.75	2.2058	8 23 17.7	9.964	16	11 32 19.53	2.0572	N. 0 02 52.7	10.532
17	9 52 40.97	2.2016	8 13 18.8	9.999	17	11 34 22.91	2.0553	S. 0 07 38.9	10.522
18	9 54 52.94	2.1974	8 03 17.8	10.033	18	11 36 26.17	2.0535	0 18 09.9	10.512
19	9 57 04.66	2.1932	7 53 14.8	10.066	19	11 38 29.33	2.0517	0 28 40.3	10.501
20	9 59 16.13	2.1891	7 43 09.9	10.097	20	11 40 32.38	2.0500	0 39 10.0	10.488
21	10 01 27.35	2.1851	7 33 03.2	10.127	21	11 42 35.33	2.0483	0 49 38.9	10.476
22	10 03 38.34	2.1811	7 22 54.7	10.157	22	11 44 38.18	2.0467	1 00 07.1	10.462
23	10 05 49.08	+ 2.1770	N. 7 12 44.4	−10.186	23	11 46 40.94	+ 2.0452	S. 1 10 34.4	−10.448
	SATURDAY 22.					**MONDAY 24.**			
0	10 07 59.58	+ 2.1731	N. 7 02 32.4	−10.212	0	11 48 43.61	+ 2.0437	S. 1 21 00.9	−10.433
1	10 10 09.85	2.1692	6 52 18.9	10.238	1	11 50 46.19	2.0422	1 31 26.4	10.418
2	10 12 19.89	2.1654	6 42 03.8	10.263	2	11 52 48.68	2.0408	1 41 51.0	10.402
3	10 14 29.70	2.1616	6 31 47.3	10.287	3	11 54 51.09	2.0395	1 52 14.6	10.384
4	10 16 39.28	2.1578	6 21 29.3	10.311	4	11 56 53.42	2.0382	2 02 37.1	10.366
5	10 18 48.64	2.1542	6 11 10.0	10.333	5	11 58 55.68	2.0369	2 12 58.5	10.347
6	10 20 57.79	2.1506	6 00 49.3	10.355	6	12 00 57.85	2.0357	2 23 18.7	10.327
7	10 23 06.71	2.1469	5 50 27.4	10.374	7	12 02 59.96	2.0346	2 33 37.8	10.307
8	10 25 15.42	2.1434	5 40 04.4	10.393	8	12 05 02.00	2.0334	2 43 55.6	10.287
9	10 27 23.92	2.1399	5 29 40.2	10.412	9	12 07 03.97	2.0323	2 54 12.2	10.265
10	10 29 32.21	2.1365	5 19 14.9	10.430	10	12 09 05.88	2.0312	3 04 27.4	10.242
11	10 31 40.30	2.1331	5 08 48.6	10.446	11	12 11 07.72	2.0302	3 14 41.3	10.219
12	10 33 48.18	2.1297	4 58 21.4	10.461	12	12 13 09.51	2.0293	3 24 53.7	10.195
13	10 35 55.87	2.1265	4 47 53.3	10.476	13	12 15 11.24	2.0284	3 35 04.7	10.172
14	10 38 03.36	2.1232	4 37 24.3	10.490	14	12 17 12.92	2.0276	3 45 14.3	10.147
15	10 40 10.66	2.1201	4 26 54.5	10.502	15	12 19 14.55	2.0268	3 55 22.3	10.120
16	10 42 17.77	2.1169	4 16 24.0	10.514	16	12 21 16.14	2.0260	4 05 28.7	10.093
17	10 44 24.69	2.1138	4 05 52.8	10.525	17	12 23 17.67	2.0253	4 15 33.5	10.067
18	10 46 31.43	2.1108	3 55 21.0	10.534	18	12 25 19.17	2.0247	4 25 36.7	10.038
19	10 48 37.99	2.1078	3 44 48.7	10.543	19	12 27 20.63	2.0240	4 35 38.1	10.010
20	10 50 44.37	2.1049	3 34 15.8	10.552	20	12 29 22.05	2.0233	4 45 37.9	9.981
21	10 52 50.58	2.1020	3 23 42.5	10.558	21	12 31 23.43	2.0227	4 55 35.8	9.951
22	10 54 56.61	2.0992	3 13 08.8	10.564	22	12 33 24.78	2.0223	5 05 32.0	9.920
23	10 57 02.48	2.0964	3 02 34.8	10.569	23	12 35 26.11	2.0218	5 15 26.2	9.888
24	10 59 08.18	+ 2.0937	N. 2 52 00.5	−10.574	24	12 37 27.40	+ 2.0213	S. 5 25 18.6	− 9.857

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 25.					**THURSDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 37 27.40	+ 2.0213	S. 5 25 18.6	− 9.857	0	14 14 37.31	+ 2.0376	S.12 29 26.8	− 7.584
1	12 39 28.67	2.0210	5 35 09.0	9.824	1	14 16 39.59	2.0384	12 37 00.0	7.522
2	12 41 29.92	2.0206	5 44 57.5	9.791	2	14 18 41.92	2.0393	12 44 29.5	7.461
3	12 43 31.14	2.0203	5 54 43.9	9.757	3	14 20 44.31	2.0402	12 51 55.3	7.398
4	12 45 32.35	2.0201	6 04 28.3	9.722	4	14 22 46.75	2.0411	12 59 17.3	7.335
5	12 47 33.55	2.0198	6 14 10.6	9.687	5	14 24 49.24	2.0420	13 06 35.5	7.271
6	12 49 34.73	2.0195	6 23 50.7	9.651	6	14 26 51.79	2.0430	13 13 49.8	7.207
7	12 51 35.89	2.0193	6 33 28.7	9.614	7	14 28 54.40	2.0440	13 21 00.3	7.142
8	12 53 37.05	2.0192	6 43 04.4	9.577	8	14 30 57.07	2.0449	13 28 06.9	7.077
9	12 55 38.20	2.0192	6 52 37.9	9.539	9	14 32 59.79	2.0457	13 35 09.6	7.012
10	12 57 39.35	2.0192	7 02 09.1	9.500	10	14 35 02.56	2.0467	13 42 08.3	6.945
11	12 59 40.50	2.0191	7 11 37.9	9.460	11	14 37 05.40	2.0477	13 49 03.0	6.878
12	13 01 41.64	2.0191	7 21 04.3	9.420	12	14 39 08.29	2.0487	13 55 53.7	6.812
13	13 03 42.79	2.0192	7 30 28.3	9.380	13	14 41 11.24	2.0497	14 02 40.4	6.744
14	13 05 43.94	2.0192	7 39 49.9	9.339	14	14 43 14.25	2.0507	14 09 23.0	6.676
15	13 07 45.09	2.0192	7 49 09.0	9.297	15	14 45 17.32	2.0517	14 16 01.5	6.607
16	13 09 46.25	2.0195	7 58 25.6	9.256	16	14 47 20.45	2.0527	14 22 35.9	6.538
17	13 11 47.43	2.0197	8 07 39.7	9.212	17	14 49 23.64	2.0536	14 29 06.1	6.468
18	13 13 48.61	2.0198	8 16 51.1	9.168	18	14 51 26.88	2.0546	14 35 32.1	6.398
19	13 15 49.81	2.0201	8 25 59.9	9.125	19	14 53 30.19	2.0557	14 41 53.9	6.328
20	13 17 51.02	2.0203	8 35 06.1	9.080	20	14 55 33.56	2.0566	14 48 11.5	6.258
21	13 19 52.25	2.0206	8 44 09.5	9.034	21	14 57 36.98	2.0575	14 54 24.9	6.187
22	13 21 53.49	2.0209	8 53 10.2	8.988	22	14 59 40.46	2.0585	15 00 33.9	6.114
23	13 23 54.76	+ 2.0213	S. 9 02 08.1	− 8.941	23	15 01 44.00	+ 2.0595	S.15 06 38.6	− 6.042
	WEDNESDAY 26.					**FRIDAY 28.**			
0	13 25 56.05	+ 2.0217	S. 9 11 03.1	− 8.893	0	15 03 47.60	+ 2.0605	S.15 12 39.0	− 5.970
1	13 27 57.36	2.0221	9 19 55.3	8.846	1	15 05 51.26	2.0614	15 18 35.0	5.897
2	13 29 58.70	2.0225	9 28 44.6	8.797	2	15 07 54.97	2.0623	15 24 26.6	5.823
3	13 32 00.06	2.0229	9 37 31.0	8.749	3	15 09 58.74	2.0633	15 30 13.8	5.750
4	13 34 01.45	2.0235	9 46 14.5	8.699	4	15 12 02.57	2.0643	15 35 56.6	5.675
5	13 36 02.88	2.0240	9 54 54.9	8.648	5	15 14 06.46	2.0653	15 41 34.8	5.600
6	13 38 04.33	2.0244	10 03 32.3	8.597	6	15 16 10.41	2.0662	15 47 08.6	5.526
7	13 40 05.81	2.0250	10 12 06.6	8.546	7	15 18 14.41	2.0672	15 52 37.9	5.450
8	13 42 07.33	2.0257	10 20 37.8	8.494	8	15 20 18.47	2.0682	15 58 02.6	5.374
9	13 44 08.89	2.0262	10 29 05.9	8.442	9	15 22 22.59	2.0691	16 03 22.8	5.298
10	13 46 10.48	2.0268	10 37 30.8	8.388	10	15 24 26.76	2.0699	16 08 38.4	5.221
11	13 48 12.11	2.0275	10 45 52.5	8.334	11	15 26 30.98	2.0708	16 13 49.3	5.143
12	13 50 13.78	2.0282	10 54 10.9	8.280	12	15 28 35.26	2.0717	16 18 55.6	5.067
13	13 52 15.49	2.0288	11 02 26.1	8.225	13	15 30 39.59	2.0727	16 23 57.3	4.988
14	13 54 17.24	2.0296	11 10 37.9	8.169	14	15 32 43.98	2.0735	16 28 54.2	4.910
15	13 56 19.04	2.0303	11 18 46.4	8.113	15	15 34 48.41	2.0743	16 33 46.5	4.832
16	13 58 20.88	2.0310	11 26 51.5	8.057	16	15 36 52.90	2.0752	16 38 34.1	4.753
17	14 00 22.76	2.0317	11 34 53.3	8.000	17	15 38 57.44	2.0760	16 43 16.9	4.674
18	14 02 24.69	2.0326	11 42 51.5	7.942	18	15 41 02.02	2.0768	16 47 55.0	4.594
19	14 04 26.67	2.0334	11 50 46.3	7.883	19	15 43 06.66	2.0777	16 52 28.2	4.514
20	14 06 28.70	2.0342	11 58 37.5	7.825	20	15 45 11.34	2.0784	16 56 56.7	4.434
21	14 08 30.77	2.0350	12 06 25.3	7.766	21	15 47 16.07	2.0792	17 01 20.3	4.353
22	14 10 32.90	2.0359	12 14 09.4	7.705	22	15 49 20.85	2.0800	17 05 39.1	4.273
23	14 12 35.08	2.0367	12 21 49.9	7.645	23	15 51 25.67	2.0807	17 09 53.1	4.192
24	14 14 37.31	+ 2.0376	S.12 29 26.8	− 7.584	24	15 53 30.53	+ 2.0814	S.17 14 02.2	− 4.111

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 29.					**MONDAY, DECEMBER 1.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 53 30.53	+ 2.0814	S.17 14 02.2	− 4.111	0	17 33 49.98	+ 2.0891	S.18 53 37.5	+ 0.007
1	15 55 35.44	2.0822	17 18 06.4	4.029					
2	15 57 40.39	2.0828	17 22 05.7	3.947					
3	15 59 45.38	2.0835	17 26 00.0	3.864					
4	16 01 50.41	2.0841	17 29 49.4	3.782					
5	16 03 55.47	2.0847	17 33 33.9	3.700					
6	16 06 00.58	2.0854	17 37 13.4	3.617					
7	16 08 05.72	2.0860	17 .40 47.9	3.532					
8	16 10 10.90	2.0866	17 44 17.3	3.449					
9	16 12 16.11	2.0871	17 47 41.8	3.366					
10	16 14 21.35	2 0876	17 51 01.2	3.282					
11	16 16 26.62	2.0881	17 54 15.6	3.197					
12	16 18 31.92	2.0886	17 57 24.9	3.113					
13	16 20 37.25	2.0891	18 00 29.2	3.028					
14	16 22 42.61	2.0895	18 03 28.3	2.943					
15	16 24 47.99	2.0899	18 06 22.4	2.858					
16	16 26 53.40	2.0903	18 09 11.3	2.773					
17	16 28 58.83	2.0907	18 11 55.2	2.688					
18	16 31 04.28	2.0910	18 14 33.9	2.602					
19	16 33 09.75	2.0913	18 17 07.5	2.517					
20	16 35 15.24	2.0916	18 19 35.9	2.431					
21	16 37 20.74	2.0918	18 21 59.2	2.345					
22	16 39 26.26	2.0921	18 24 17.3	2.258					
23	16 41 31.79	+ 2.0923	S.18 26 30.2	− 2.172					
	SUNDAY 30.					**PHASES OF THE MOON.**			
0	16 43 37.34	+ 2.0926	S.18 28 37.9	− 2.086					
1	16 45 42.90	2.0927	18 30 40.5	1.999					
2	16 47 48.47	2.0928	18 32 37.8	1.912					
3	16 49 54.04	2.0929	18 34 30.0	1.827					
4	16 51 59.62	2.0931	18 36 17.0	1.739					
5	16 54 05.21	2.0932	18 37 58.7	1.652					
6	16 56 10.80	2.0932	18 39 35.3	1.566					
7	16 58 16.39	2.0931	18 41 06.6	1.478					
8	17 00 21.97	2.0931	18 42 32.7	1.391					
9	17 02 27.56	2.0931	18 43 53.5	1.303					
10	17 04 33.14	2.0930	18 45 09.1	1.217					
11	17 06 38.72	2.0929	18 46 19.5	1.130					
12	17 08 44.29	2.0927	18 47 24.7	1.042					
13	17 10 49.85	2.0926	18 48 24.6	0.955					
14	17 12 55.40	2.0924	18 49 19.3	0.867					
15	17 15 00.94	2.0922	18 50 08.7	0.779					
16	17 17 06.47	2.0920	18 50 52.8	0.692					
17	17 19 11.98	2.0917	18 51 31.7	0.605					
18	17 21 17.47	2.0913	18 52 05.4	0.518					
19	17 23 22.94	2.0911	18 52 33.9	0.431					
20	17 25 28.40	2.0907	18 52 57.1	0.343					
21	17 27 33.83	2.0903	18 53 15.0	0.256					
22	17 29 39.24	2.0899	18 53 27.8	0.169					
23	17 31 44.62	2.0895	18 53 35.3	− 0.081					
24	17 33 49.98	+ 2.0891	S.18 53 37.5	+ 0.007					

PHASES OF THE MOON.

			d	h	m
☽	First Quarter . . . Nov.		8	00	30.5
○	Full Moon		15	05	06.5
☾	Last Quarter		21	19	46.9
●	New Moon		29	14	04.4

			d	h
☾	Apogee . . . . Nov.		4	13.9
☾	Perigee		16	14.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Noon.	P. L. of Diff.	IIIʰ.	P. L. of Diff.	VIʰ.	P. L. of Diff.	IXʰ.	P. L. of Diff.
			°　′　″		°　′　″		°　′　″		°　′　″	
1	Sun	W.	13 15 20	3319	14 39 10	3325	16 02 52	3332	17 26 26	3339
	Saturn	E.	61 05 16	2983	59 34 42	2992	58 04 19	3001	56 34 07	3009
	Jupiter	E.	77 32 36	2994	76 02 16	3001	74 32 05	3009	73 02 04	3018
	Fomalhaut	E.	101 22 23	3391	99 59 56	3394	98 37 33	3399	97 15 15	3403
	a Pegasi	E.	118 06 56	3169	116 40 10	3171	115 13 26	3173	113 46 45	3177
2	Sun	W.	24 22 12	3376	25 44 56	3382	27 07 33	3389	28 30 02	3395
	Saturn	E.	49 05 47	3052	47 36 39	3060	46 07 41	3069	44 38 54	3078
	Jupiter	E.	65 34 31	3057	64 05 29	3065	62 36 37	3073	61 07 54	3080
	Fomalhaut	E.	90 25 12	3433	89 03 33	3439	87 42 01	3446	86 20 37	3454
	a Pegasi	E.	106 34 14	3193	105 07 56	3197	103 41 43	3200	102 15 34	3204
3	Sun	W.	35 20 39	3426	36 42 26	3431	38 04 08	3436	39 25 44	3440
	Saturn	E.	37 17 36	3121	35 49 52	3131	34 22 20	3140	32 54 59	3149
	Jupiter	E.	53 46 32	3115	52 18 41	3121	50 50 57	3128	49 23 21	3134
	Fomalhaut	E.	79 35 57	3498	78 15 31	3509	76 55 17	3518	75 35 13	3529
	a Pegasi	E.	95 06 07	3226	93 40 29	3231	92 14 56	3235	90 49 28	3239
4	Sun	W.	46 12 32	3459	47 33 42	3463	48 54 48	3464	50 15 52	3465
	Antares	W.	20 52 57	3420	22 14 51	3386	23 37 24	3354	25 00 33	3326
	Jupiter	E.	42 07 14	3164	40 40 22	3171	39 13 38	3177	37 47 01	3183
	Fomalhaut	E.	68 58 00	3588	67 39 13	3602	66 20 41	3616	65 02 24	3632
	a Pegasi	E.	83 43 21	3259	82 18 22	3263	80 53 27	3266	79 28 36	3270
	a Arietis	E.	127 16 42	3198	125 50 30	3197	124 24 17	3195	122 58 02	3193
5	Sun	W.	57 00 52	3470	58 21 50	3469	59 42 49	3468	61 03 49	3466
	Antares	W.	32 02 53	3238	33 28 17	3225	34 53 56	3214	36 19 49	3204
	Jupiter	E.	30 35 48	3218	29 10 00	3226	27 44 22	3236	26 18 55	3247
	Fomalhaut	E.	58 35 19	3719	57 18 52	3739	56 02 46	3762	54 47 04	3785
	a Pegasi	E.	72 25 24	3287	71 00 57	3289	69 36 33	3293	68 12 13	3295
	a Arietis	E.	115 46 04	3181	114 19 32	3178	112 52 57	3175	111 26 18	3171
6	Sun	W.	67 49 27	3451	69 10 46	3447	70 32 09	3442	71 53 38	3436
	Antares	W.	43 32 05	3158	44 59 04	3149	46 26 14	3140	47 53 35	3132
	Fomalhaut	E.	48 35 23	3936	47 22 40	3975	46 10 36	4017	44 59 13	4064
	a Pegasi	E.	61 11 23	3311	59 47 24	3314	58 23 29	3318	56 59 38	3322
	a Arietis	E.	104 11 55	3151	102 44 47	3146	101 17 33	3140	99 50 12	3134
7	Sun	W.	78 42 48	3401	80 05 03	3393	81 27 27	3384	82 50 02	3375
	Antares	W.	55 13 01	3086	56 41 28	3075	58 10 08	3065	59 39 01	3054
	Fomalhaut	E.	39 15 14	4383	38 09 37	4471	37 05 19	4569	36 02 27	4680
	a Pegasi	E.	50 01 41	3349	48 38 26	3356	47 15 19	3365	45 52 22	3375
	a Arietis	E.	92 31 35	3101	91 03 26	3092	89 35 07	3084	88 06 38	3076
	Aldebaran	E.	125 52 36	3024	124 22 53	3016	122 53 00	3007	121 22 56	2999
8	Sun	W.	89 45 50	3319	91 09 39	3307	92 33 42	3294	93 58 00	3281
	Antares	W.	67 06 48	2997	68 37 05	2984	70 07 38	2970	71 38 28	2958
	Saturn	W.	22 48 09	3095	24 16 25	3071	25 45 10	3047	27 14 24	3025
	a Arietis	E.	80 41 27	3027	79 11 48	3017	77 41 56	3005	76 11 50	2993
	Aldebaran	E.	113 49 43	2948	112 18 25	2936	110 46 52	2924	109 15 03	2912
9	Sun	W.	101 03 38	3207	102 29 39	3192	103 55 58	3175	105 22 37	3158

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVʰ.	P. L. of Diff.	XVIIIʰ.	P. L. of Diff.	XXIʰ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Sun	W.	18 49 52	3347	20 13 09	3354	21 36 18	3361	22 59 19	3368
	Saturn	E.	55 04 05	3018	53 34 14	3027	52 04 35	3035	50 35 06	3043
	Jupiter	E.	71 32 13	3026	70 02 33	3034	68 33 03	3042	67 03 42	3050
	Fomalhaut	E.	95 53 02	3408	94 30 55	3414	93 08 54	3419	91 46 59	3426
	a Pegasi	E.	112 20 08	3179	110 53 34	3182	109 27 03	3185	108 00 36	3189
2	Sun	W.	29 52 24	3402	31 14 38	3408	32 36 45	3415	33 58 45	3420
	Saturn	E.	43 10 17	3087	41 41 51	3095	40 13 35	3104	38 45 30	3113
	Jupiter	E.	59 39 20	3087	58 10 55	3095	56 42 39	3101	55 14 31	3109
	Fomalhaut	E.	84 59 22	3463	83 38 17	3471	82 17 20	3480	80 56 33	3489
	a Pegasi	E.	100 49 30	3209	99 23 32	3214	97 57 39	3217	96 31 50	3222
3	Sun	W.	40 47 15	3445	42 08 41	3449	43 30 02	3453	44 51 19	3456
	Saturn	E.	31 27 49	3160	30 00 52	3172	28 34 09	3183	27 07 40	3195
	Jupiter	E.	47 55 53	3140	46 28 37	3147	45 01 19	3153	43 34 13	3158
	Fomalhaut	E.	74 15 21	3540	72 55 41	3553	71 36 15	3564	70 17 01	3576
	a Pegasi	E.	89 24 05	3243	87 58 47	3247	86 33 34	3251	85 08 25	3255
4	Sun	W.	51 36 55	3467	52 57 56	3469	54 18 55	3469	55 39 54	3470
	Antares	W.	26 24 14	3303	27 48 22	3282	29 12 54	3266	30 37 45	3252
	Jupiter	E.	36 20 31	3188	34 54 08	3195	33 27 53	3202	32 01 46	3209
	Fomalhaut	E.	63 44 24	3647	62 26 40	3663	61 09 14	3681	59 52 07	3699
	a Pegasi	E.	78 03 50	3274	76 39 08	3277	75 14 30	3280	73 49 55	3283
	a Arietis	E.	121 31 44	3190	120 05 23	3188	118 39 00	3185	117 12 33	3183
5	Sun	W.	62 24 51	3464	63 45 55	3462	65 07 02	3458	66 28 13	3455
	Antares	W.	37 45 54	3194	39 12 10	3185	40 38 37	3175	42 05 16	3167
	Jupiter	E.	24 53 41	3261	23 28 44	3278	22 04 07	3296	20 39 51	3316
	Fomalhaut	E.	53 31 46	3811	52 16 55	3839	51 02 33	3868	49 48 41	3902
	a Pegasi	E.	66 47 56	3298	65 23 42	3301	63 59 32	3305	62 35 26	3307
	a Arietis	E.	109 59 34	3168	108 32 47	3164	107 05 55	3160	105 38 58	3155
6	Sun	W.	73 15 14	3431	74 36 56	3424	75 58 45	3417	77 20 42	3409
	Antares	W.	49 21 06	3124	50 48 47	3114	52 16 40	3104	53 44 45	3095
	Fomalhaut	E.	43 48 36	4115	42 38 49	4172	41 29 56	4234	40 22 02	4305
	a Pegasi	E.	55 35 52	3325	54 12 10	3331	52 48 34	3336	51 25 04	3342
	a Arietis	E.	98 22 44	3129	96 55 09	3122	95 27 26	3115	93 59 35	3108
7	Sun	W.	84 12 47	3365	85 35 44	3354	86 58 53	3343	88 22 15	3332
	Antares	W.	61 08 07	3043	62 37 26	3032	64 06 59	3021	65 36 46	3009
	Fomalhaut	E.	35 01 11	4805	34 01 39	4949	33 04 03	5112	32 08 35	5298
	a Pegasi	E.	44 29 37	3386	43 07 05	3400	41 44 49	3415	40 22 50	3434
	a Arietis	E.	86 37 59	3067	85 09 09	3057	83 40 07	3047	82 10 53	3038
	Aldebaran	E.	119 52 42	2989	118 22 16	2980	116 51 38	2969	115 20 47	2959
8	Sun	W.	95 22 34	3267	96 47 24	3253	98 12 31	3237	99 37 56	3223
	Antares	W.	73 09 34	2944	74 40 57	2931	76 12 37	2916	77 44 36	2901
	Saturn	W.	28 44 06	3003	30 14 15	2983	31 44 49	2963	33 15 48	2943
	a Arietis	E.	74 41 29	2982	73 10 54	2971	71 40 05	2959	70 09 01	2946
	Aldebaran	E.	107 42 59	2898	106 10 38	2886	104 38 01	2872	103 05 06	2858
9	Sun	W.	106 49 37	3141	108 16 57	3124	109 44 37	3106	111 12 39	3087

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object	Noon.	P. L. of Diff	IIIʰ.	P. L. of Diff.	VIʰ.	P. L. of Diff.	IXʰ.	P. L. of Diff.
		° ′ ″		° ′ ″		° ′ ″		° ′ ″	
9	Antares W.	79 16 53	2886	80 49 30	2872	82 22 25	2855	83 55 41	2840
	SATURN W.	34 47 12	2924	36 19 00	2905	37 51 12	2886	39 23 49	2867
	α Aquilæ W.	35 32 43	4259	36 40 14	4142	37 49 35	4035	39 00 40	3939
	JUPITER W.	18 31 42	3103	19 59 48	3060	21 28 46	3022	22 58 31	2986
	α Arietis E.	68 37 41	2934	67 06 05	2922	65 34 14	2909	64 02 07	2896
	Aldebaran E.	101 31 53	2843	99 58 21	2829	98 24 31	2813	96 50 20	2798
10	SUN W.	112 41 04	3069	114 09 51	3052	115 39 00	3032	117 08 33	3013
	Antares W.	91 47 12	2757	93 22 36	2741	94 58 22	2723	96 34 31	2706
	SATURN W.	47 12 56	2773	48 47 59	2754	50 23 27	2735	51 59 20	2716
	α Aquilæ W.	45 18 10	3557	46 37 31	3497	47 57 59	3438	49 19 32	3385
	JUPITER W.	30 37 38	2841	32 11 13	2815	33 45 21	2792	35 20 00	2768
	α Arietis E.	56 17 21	2832	54 43 35	2819	53 09 32	2807	51 35 13	2795
	Aldebaran E.	88 54 15	2716	87 17 56	2698	85 41 14	2681	84 04 08	2663
11	Antares W.	104 41 09	2618	106 19 40	2599	107 58 36	2583	109 37 55	2564
	SATURN W.	60 05 13	2620	61 43 41	2600	63 22 36	2580	65 01 58	2561
	α Aquilæ W.	56 21 41	3155	57 48 44	3116	59 16 34	3078	60 45 11	3041
	JUPITER W.	43 20 47	2657	44 58 25	2637	46 36 30	2615	48 15 05	2593
	α Arietis E.	43 40 02	2746	42 04 23	2739	40 28 36	2734	38 52 41	2729
	Aldebaran E.	75 52 38	2572	74 13 05	2554	72 33 07	2535	70 52 43	2517
	Pollux E.	118 20 00	2690	116 43 07	2669	115 05 46	2647	113 27 55	2626
12	SATURN W.	73 25 25	2466	75 07 26	2447	76 49 54	2429	78 32 48	2410
	α Aquilæ W.	68 18 55	2881	69 51 38	2853	71 24 57	2825	72 58 52	2800
	JUPITER W.	56 35 06	2492	58 16 30	2473	59 58 21	2453	61 40 40	2436
	Aldebaran E.	62 24 14	2424	60 41 14	2406	58 57 48	2388	57 13 56	2371
	Pollux E.	105 11 29	2522	103 30 47	2502	101 49 37	2483	100 08 00	2465
13	SATURN W.	87 13 43	2323	88 59 09	2307	90 44 58	2291	92 31 11	2276
	α Aquilæ W.	80 56 28	2686	82 33 27	2666	84 10 53	2648	85 48 43	2630
	JUPITER W.	70 18 48	2344	72 03 43	2328	73 49 02	2311	75 34 46	2295
	Aldebaran E.	48 28 19	2285	46 41 57	2269	44 55 12	2253	43 08 04	2238
	Pollux E.	91 33 24	2375	89 49 14	2359	88 04 40	2344	86 19 44	2328
14	SATURN W.	101 27 46	2204	103 16 07	2192	105 04 46	2180	106 53 43	2170
	α Aquilæ W.	94 03 18	2561	95 43 06	2551	97 23 09	2542	99 03 24	2535
	JUPITER W.	84 29 01	2223	86 16 55	2210	88 05 08	2197	89 53 40	2186
	Aldebaran E.	34 06 55	2170	32 17 42	2159	30 28 12	2147	28 38 24	2136
	Pollux E.	77 29 47	2262	75 42 51	2250	73 55 38	2241	72 08 11	2231
	Regulus E.	113 54 35	2180	112 05 38	2167	110 16 21	2154	108 26 44	2141
15	JUPITER W.	99 00 21	2137	100 50 23	2130	102 40 36	2124	104 30 59	2117
	Pollux E.	63 07 48	2198	61 19 17	2194	59 30 41	2192	57 42 01	2191
	Regulus E.	99 14 26	2092	97 23 15	2085	95 31 52	2077	93 40 18	2070
16	JUPITER W.	113 44 50	2099	115 35 50	2098	117 26 53	2098	119 17 56	2098
	α Arietis W.	30 45 34	2337	32 30 40	2307	34 16 30	2280	36 02 59	2258
	Pollux E.	48 39 04	2209	46 50 50	2218	45 02 49	2229	43 15 04	2242
	Regulus E.	84 20 17	2049	82 27 59	2048	80 35 39	2046	78 43 16	2045
17	α Arietis W.	45 02 00	2193	46 50 38	2187	48 39 25	2182	50 28 19	2180

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVᵇ.	P. L. of Diff.	XVIIIᵇ.	P. L. of Diff.	XXIᵇ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
9	Antares	W.	85 29 17	2824	87 03 14	2808	88 37 31	2792	90 12 10	2774
	SATURN	W.	40 56 50	2848	42 30 15	2830	44 04 04	2811	45 38 18	2792
	a Aquilæ	W.	40 13 20	3851	41 27 30	3768	42 43 05	3693	44 00 00	3623
	JUPITER	W.	24 29 01	2951	26 00 15	2920	27 32 08	2893	29 04 36	2866
	a Arietis	E.	62 29 43	2883	60 57 02	2870	59 24 05	2857	57 50 51	2845
	Aldebaran	E.	95 15 49	2782	93 40 57	2766	92 05 45	2750	90 30 11	2733
10	SUN	W.	118 38 30	2994	120 08 50	2975	121 39 34	2955	123 10 43	2935
	Antares	W.	98 11 03	2688	99 47 59	2671	101 25 18	2653	103 03 01	2635
	SATURN	W.	53 35 39	2696	55 12 24	2678	56 49 34	2657	58 27 11	2639
	a Aquilæ	W.	50 42 06	3334	52 05 38	3286	53 30 06	3240	54 55 28	3197
	JUPITER	W.	36 55 10	2745	38 30 50	2723	40 06 59	2701	41 43 38	2678
	a Arietis	E.	50 00 39	2784	48 25 50	2773	46 50 47	2763	45 15 30	2754
	Aldebaran	E.	82 26 39	2646	80 48 46	2627	79 10 28	2610	77 31 46	2591
11	Antares	W.	111 17 39	2547	112 57 47	2530	114 38 19	2512	116 19 15	2495
	SATURN	W.	66 41 46	2542	68 22 01	2523	70 02 42	2504	71 43 50	2485
	a Aquilæ	W.	62 14 33	3007	63 44 37	2973	65 15 23	2941	66 46 50	2911
	JUPITER	W.	49 54 09	2572	51 33 42	2553	53 13 41	2533	54 54 09	2512
	a Arietis	E.	37 16 40	2729	35 40 38	2731	34 04 39	2735	32 28 46	2743
	Aldebaran	E.	69 11 53	2499	67 30 38	2480	65 48 56	2461	64 06 48	2443
	Pollux	E.	111 49 35	2604	110 10 46	2584	108 31 29	2563	106 51 43	2543
12	SATURN	W.	80 16 08	2392	81 59 54	2375	83 44 05	2357	85 28 42	2340
	a Aquilæ	W.	74 33 20	2775	76 08 21	2750	77 43 54	2728	79 19 57	2707
	JUPITER	W.	63 23 24	2416	65 06 36	2398	66 50 14	2379	68 34 19	2362
	Aldebaran	E.	55 29 39	2353	53 44 57	2335	51 59 49	2318	50 14 16	2302
	Pollux	E.	98 25 57	2445	96 43 27	2427	95 00 31	2410	93 17 10	2392
13	SATURN	W.	94 17 46	2260	96 04 44	2245	97 52 04	2231	99 39 45	2218
	a Aquilæ	W.	87 26 57	2614	89 05 33	2599	90 44 30	2585	92 23 45	2572
	JUPITER	W.	77 20 53	2280	79 07 22	2264	80 54 14	2251	82 41 27	2236
	Aldebaran	E.	41 20 33	2223	39 32 40	2208	37 44 25	2195	35 55 50	2182
	Pollux	E.	84 34 25	2313	82 48 45	2300	81 02 45	2286	79 16 25	2274
14	SATURN	W.	108 42 56	2159	110 32 26	2149	112 22 10	2140	114 12 08	2131
	a Aquilæ	W.	100 43 49	2528	102 24 23	2523	104 05 04	2521	105 45 48	2522
	JUPITER	W.	91 42 29	2174	93 31 35	2165	95 20 55	2155	97 10 31	2145
	Aldebaran	E.	26 48 20	2127	24 58 02	2119	23 07 32	2111	21 16 49	2103
	Pollux	E.	70 20 29	2222	68 32 34	2214	66 44 28	2208	64 56 12	2202
	Regulus	E.	106 36 48	2131	104 46 36	2120	102 56 08	2110	101 05 24	2101
15	JUPITER	W.	106 21 32	2112	108 12 13	2108	110 03 00	2104	111 53 53	2101
	Pollux	E.	55 53 20	2192	54 04 40	2193	52 16 02	2196	50 27 29	2202
	Regulus	E.	91 48 33	2064	89 56 39	2060	88 04 38	2055	86 12 30	2052
16	JUPITER	W.	121 08 59	2099	122 59 59	2101	124 50 56	2103	126 41 49	2107
	a Arietis	W.	37 50 00	2239	39 37 30	2223	41 25 23	2211	43 13 34	2201
	Pollux	E.	41 27 39	2259	39 40 39	2279	37 54 08	2301	36 08 10	2328
	Regulus	E.	76 50 52	2046	74 58 29	2046	73 06 07	2048	71 13 47	2051
17	a Arietis	W.	52 17 17	2180	54 06 15	2179	55 55 14	2180	57 44 12	2182

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Day of the Month	Name and Direction of Object		Noon.	P.L. of Diff.	IIIʰ.	P.L. of Diff.	VIʰ.	P.L. of Diff.	IXʰ.	P.L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
17	Aldebaran	W.	10 48 42	2090	12 39 57	2083	14 31 22	2079	16 22 54	2076
	Regulus	E.	69 21 32	2054	67 29 22	2057	65 37 17	2062	63 45 19	2068
	Spica	E.	122 57 32	2039	121 04 59	2042	119 12 30	2046	117 20 07	2051
18	a Arietis	W.	59 33 06	2186	61 21 54	2191	63 10 35	2196	64 59 09	2202
	Aldebaran	W.	25 40 30	2092	27 31 41	2098	29 22 43	2106	31 13 33	2115
	Regulus	E.	54 27 54	2104	52 37 01	2113	50 46 22	2123	48 55 58	2134
	Spica	E.	108 00 21	2083	106 08 55	2092	104 17 43	2099	102 26 43	2108
19	a Arietis	W.	73 59 16	2244	75 46 38	2255	77 33 44	2265	79 20 35	2277
	Aldebaran	W.	40 24 16	2164	42 13 38	2175	44 02 43	2186	45 51 31	2198
	Spica	E.	93 15 23	2161	91 25 56	2172	89 36 47	2184	87 47 55	2196
	Sun	E.	127 01 35	2476	125 19 48	2488	123 38 18	2500	121 57 05	2513
20	a Arietis	W.	88 10 28	2339	89 55 30	2353	91 40 13	2366	93 24 36	2380
	Aldebaran	W.	54 50 53	2263	56 37 47	2277	58 24 21	2289	60 10 36	2303
	Spica	E.	78 48 21	2261	77 01 25	2274	75 14 48	2289	73 28 32	2303
	Sun	E.	113 35 41	2583	111 56 23	2597	110 17 24	2612	108 38 45	2627
21	a Arietis	W.	102 01 19	2455	103 43 35	2470	105 25 30	2486	107 07 03	2502
	Aldebaran	W.	68 56 47	2373	70 41 00	2388	72 24 52	2401	74 08 25	2416
	Pollux	W.	28 12 48	2801	29 47 15	2774	31 22 17	2752	32 57 48	2735
	Spica	E.	64 42 20	2373	62 58 07	2388	61 14 15	2402	59 30 43	2417
	Sun	E.	100 30 40	2703	98 54 04	2719	97 17 50	2734	95 41 55	2749
22	Aldebaran	W.	82 41 06	2486	84 22 39	2499	86 03 53	2513	87 44 48	2526
	Pollux	W.	40 59 24	2700	42 36 04	2701	44 12 43	2704	45 49 18	2707
	Spica	E.	50 58 08	2487	49 16 37	2501	47 35 25	2515	45 54 32	2529
	Sun	E.	87 47 22	2825	86 13 27	2841	84 39 52	2855	83 06 36	2869
23	Aldebaran	W.	96 04 47	2592	97 43 53	2604	99 22 42	2617	101 01 14	2629
	Pollux	W.	53 50 54	2732	55 26 51	2740	57 02 38	2746	58 38 17	2754
	Spica	E.	37 34 53	2596	35 55 52	2609	34 17 09	2622	32 38 44	2635
	Sun	E.	75 24 53	2942	73 53 27	2955	72 22 18	2969	70 51 26	2982
24	Aldebaran	W.	109 09 50	2688	110 46 46	2698	112 23 28	2710	113 59 55	2721
	Pollux	W.	66 33 49	2796	68 08 22	2805	69 42 44	2813	71 16 55	2821
	Regulus	W.	29 35 52	2745	31 11 32	2751	32 47 04	2757	34 22 28	2764
	Spica	E.	24 30 57	2698	22 54 15	2711	21 17 50	2725	19 41 44	2740
	Sun	E.	63 21 16	3047	61 52 02	3060	60 23 03	3072	58 54 19	3083
25	Pollux	W.	79 05 00	2866	80 38 03	2874	82 10 55	2883	83 43 36	2891
	Regulus	W.	42 17 07	2801	43 51 33	2809	45 25 49	2817	46 59 55	2824
	Sun	E.	51 34 14	3141	50 06 54	3153	48 39 48	3163	47 12 54	3174
26	Pollux	W.	91 24 17	2934	92 55 53	2942	94 27 18	2951	95 58 32	2958
	Regulus	W.	54 47 58	2862	56 21 05	2870	57 54 02	2877	59 26 51	2884
	Sun	E.	40 01 39	3226	38 36 01	3236	37 10 35	3247	35 45 21	3257
27	Pollux	W.	103 32 09	3001	105 02 20	3009	106 32 21	3018	108 02 12	3026
	Regulus	W.	67 08 37	2919	68 40 32	2926	70 12 18	2932	71 43 57	2939
	Sun	E.	28 42 12	3310	27 18 12	3321	25 54 25	3332	24 30 51	3345

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LUNAR DISTANCES.

Day of the Month	Name and Direction of Object	Midnight. ° ' "	P. L. of Diff.	XVʰ. ° ' "	P. L. of Diff.	XVIIIʰ. ° ' "	P. L. of Diff.	XXIʰ. ° ' "	P. L. of Diff.
17	Aldebaran W.	18 14 30	2075	20 06 08	2077	21 57 43	2081	23 49 11	2087
	Regulus E.	61 53 30	2073	60 01 50	2080	58 10 20	2087	56 19 01	2095
	Spica E.	115 27 52	2056	113 35 45	2062	111 43 47	2068	109 51 59	2075
18	a Arietis W.	66 47 34	2210	68 35 47	2217	70 23 49	2225	72 11 39	2234
	Aldebaran W.	33 04 10	2124	34 54 33	2133	36 44 42	2142	38 34 37	2153
	Regulus E.	47 05 51	2145	45 16 01	2157	43 26 29	2170	41 37 16	2183
	Spica E.	100 35 56	2118	98 45 24	2128	96 55 08	2138	95 05 07	2149
19	a Arietis W.	81 07 09	2288	82 53 26	2300	84 39 25	2313	86 25 06	2326
	Aldebaran W.	47 40 02	2211	49 28 13	.2224	51 16 05	2236	53 03 39	2249
	Spica E.	85 59 22	2209	84 11 08	2222	82 23 13	2235	80 35 37	2248
	Sun E.	120 16 10	2527	118 35 34	2541	116 55 18	2554	115 15 20	2568
20	a Arietis W.	95 08 39	2395	96 52 21	2410	98 35 41	2424	100 18 41	2440
	Aldebaran W.	61 56 31	2317	63 42 05	2331	65 27 19	2345	67 12 13	2359
	Spica E.	71 42 37	2317	69 57 02	2331	68 11 48	2345	66 26 54	2359
	Sun E.	107 00 27	2643	105 22 30	2657	103 44 53	2672	102 07 36	2688
21	a Arietis W.	108 48 14	2518	110 29 02	2534	112 09 28	2551	113 49 31	2566
	Aldebaran W.	75 51 37	2430	77 34 29	2444	79 17 01	2458	80 59 13	2472
	Pollux W.	34 33 41	2722	36 09 52	2712	37 46 16	2707	39 22 47	2702
	Spica E.	57 47 32	2431	56 04 41	2445	54 22 10	2459	52 39 59	2473
	Sun E.	94 06 20	2765	92 31 06	2780	90 56 12	2795	89 21 37	2810
22	Aldebaran W.	89 25 25	2540	91 05 43	2553	92 45 42	2566	94 25 23	2579
	Pollux W.	47 25 49	2710	49 02 15	2715	50 38 35	2720	52 14 48	2725
	Spica E.	44 13 59	2543	42 33 45	2556	40 53 49	2569	39 14 12	2583
	Sun E.	81 33 38	2884	80 00 59	2899	78 28 39	2913	76 56 37	2927
23	Aldebaran W.	102 39 30	2641	104 17 29	2654	105 55 11	2665	107 32 38	2676
	Pollux W.	60 13 45	2763	61 49 02	2771	63 24 08	2779	64 59 04	2787
	Spica E.	31 00 36	2647	29 22 45	2660	27 45 12	2673	26 07 56	2686
	Sun E.	69 20 51	2996	67 50 33	3009	66 20 32	3022	64 50 46	3034
24	Aldebaran W.	115 36 07	2732	117 12 05	2741	118 47 50	2752	120 23 21	2762
	Pollux W.	72 50 55	2831	74 24 43	2839	75 58 20	2848	77 31 46	2857
	Regulus W.	35 57 43	2772	37 32 48	2779	39 07 44	2786	40 42 30	2793
	Spica E.	18 05 57	2755	16 30 30	2771	14 55 24	2786	13 20 38	2801
	Sun E.	57 25 49	3096	55 57 34	3108	54 29 34	3119	53 01 47	3130
25	Pollux W.	85 16 06	2900	86 48 25	2909	88 20 33	2917	89 52 30	2925
	Regulus W.	48 33 52	2832	50 07 38	2840	51 41 14	2847	53 14 41	2855
	Sun E.	45 46 14	3185	44 19 47	3195	42 53 32	3205	41 27 29	3216
26	Pollux W.	97 29 37	2967	99 00 31	2976	100 31 14	2984	102 01 47	2993
	Regulus W.	60 59 30	2891	62 32 00	2898	64 04 21	2905	65 36 33	2912
	Sun E.	34 20 19	3267	32 55 29	3277	31 30 51	3288	30 06 25	3299
27	Pollux W.	109 31 52	3034	111 01 22	3044	112 30 40	3052	113 59 48	3060
	Regulus W.	73 15 27	2945	74 46 49	2951	76 18 03	2957	77 49 10	2963
	Sun E.	23 07 32	3359	21 44 29	3374	20 21 43	3388	18 59 13	3403

AT GREENWICH APPARENT NOON.

Day of the Week	Day of the Month	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	16 26 28.57	+ 10.783	S. 21 42 34.8	− 24.03	16 14.55	70.14	11 07.27	0.924
Tues.	2	16 30 47.69	10.809	21 51 58.9	22.98	16 14.70	70.23	10 44.76	0.951
Wed.	3	16 35 07.43	10.835	22 00 57.9	21.92	16 14.85	70.31	10 21.64	0.976
Thur.	4	16 39 27.78	+ 10.860	22 09 31.6	− 20.86	16 14.99	70.39	9 57.92	1.001
Frid.	5	16 43 48.71	10.884	22 17 39.3	19.78	16 15.13	70.47	9 33.60	1.024
Sat.	6	16 48 10.20	10.906	22 25 21.1	18.69	16 15.26	70.55	9 08.74	1.046
SUN.	7	16 52 32.21	+ 10.927	22 32 36.7	− 17.59	16 15.39	70.62	8 43.36	1.067
Mon.	8	16 56 54.71	10.947	22 39 25.9	16.49	16 15.51	70.69	8 17.48	1.088
Tues.	9	17 01 17.68	10.966	22 45 48.2	15.37	16 15.63	70.76	7 51.14	1.107
Wed.	10	17 05 41.09	+ 10.984	22 51 43.9	− 14.25	16 15.75	70.82	7 24.36	1.124
Thur.	11	17 10 04.92	11.001	22 57 12.3	13.11	16 15.86	70.88	6 57.15	1.140
Frid.	12	17 14 29.14	11.016	23 02 13.5	11.97	16 15.97	70.93	6 29.57	1.156
Sat.	13	17 18 53.72	+ 11.031	23 06 47.3	− 10.83	16 16.08	70.98	6 01.64	1.171
SUN.	14	17 23 18.61	11.044	23 10 53.5	9.68	16 16.18	71.02	5 33.38	1.184
Mon.	15	17 27 43.81	11.056	23 14 32.1	8.53	16 16.28	71.06	5 04.80	1.196
Tues.	16	17 32 09.30	+ 11.067	23 17 42.8	− 7.37	16 16.37	71.09	4 35.95	1.207
Wed.	17	17 36 35.04	11.077	23 20 25.5	6.19	16 16.45	71.12	4 06.85	1.217
Thur.	18	17 41 01.01	11.085	23 22 40.1	5.02	16 16.53	71.14	3 37.51	1.226
Frid.	19	17 45 27.16	+ 11.093	23 24 26.7	− 3.85	16 16.60	71.16	3 08.00	1.233
Sat.	20	17 49 53.49	11.099	23 25 45.1	2.67	16 16.67	71.18	2 38.31	1.239
SUN.	21	17 54 19.94	11.104	23 26 35.1	1.50	16 16.73	71.19	2 08.50	1.244
Mon.	22	17 58 46.49	+ 11.108	23 26 57.0	− 0.32	16 16.79	71.20	1 38.58	1.247
Tues.	23	18 03 13.11	11.110	23 26 50.5	+ 0.86	16 16.85	71.21	1 08.61	1.249
Wed.	24	18 07 39.75	11.109	23 26 15.7	2.04	16 16.90	71.21	0 38.62	1.249
Thur.	25	18 12 06.38	+ 11.108	23 25 12.7	+ 3.22	16 16.94	71.20	0 08.62	1.248
Frid.	26	18 16 32.95	11.105	23 23 41.3	4.39	16 16.98	71.19	0 21.31	1.245
Sat.	27	18 20 59.44	11.101	23 21 41.7	5.57	16 17.01	71.17	0 51.16	1.241
SUN.	28	18 25 25.81	+ 11.095	23 19 13.8	+ 6.74	16 17.02	71.15	1 20.89	1.235
Mon.	29	18 29 52.02	11.088	23 16 17.9	7.91	16 17.04	71.12	1 50.46	1.228
Tues.	30	18 34 18.03	11.079	23 12 54.1	9.08	16 17.06	71.09	2 19.84	1.219
Wed.	31	18 38 43.80	11.069	23 09 02.3	10.24	16 17.08	71.06	2 48.97	1.208
Thur.	32	18 43 09.30	+ 11.059	S. 23 04 42.6	+ 11.39	16 17.09	71.02	3 17.84	1.196

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting 0.19ˢ from the sidereal time. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	16 26 30.56	+ 10.780	S. 21 42 39.2	− 24.02	11 07.10	− 0.924	16 37 37.66
Tues.	2	16 30 49.62	10.807	21 52 03.0	22.97	10 44.59	0.951	16 41 34.21
Wed.	3	16 35 09.30	10.832	22 01 01.7	21.91	10 21.47	0.976	16 45 30.77
Thur.	4	16 39 29.58	+ 10.857	22 09 35.0	− 20.85	9 57.75	− 1.001	16 49 27.33
Frid.	5	16 43 50.44	10.880	22 17 42.4	19.77	9 33.44	1.024	16 53 23.88
Sat.	6	16 48 11.86	10.903	22 25 23.9	18.68	9 08.58	1.046	16 57 20.44
SUN.	7	16 52 33.79	+ 10.924	22 32 39.2	− 17.58	8 43.21	− 1.067	17 01 17.00
Mon.	8	16 56 56.22	10.944	22 39 28.1	16.48	8 17.33	1.088	17 05 13.55
Tues.	9	17 01 19.12	10.963	22 45 50.2	15.36	7 50.99	1.107	17 09 10.11
Wed.	10	17 05 42.45	+ 10.981	22 51 45.6	− 14.24	7 24.22	− 1.124	17 13 06.67
Thur.	11	17 10 06.20	10.997	22 57 13.8	13.10	6 57.02	1.140	17 17 03.22
Frid.	12	17 14 30.33	11.013	23 02 14.8	11.96	6 29.45	1.156	17 20 59.78
Sat.	13	17 18 54.82	+ 11.027	23 06 48.4	− 10.82	6 01.52	− 1.171	17 24 56.34
SUN.	14	17 23 19.63	11.040	23 10 54.4	9.67	5 33.27	1.184	17 28 52.90
Mon.	15	17 27 44.75	11.052	23 14 32.8	8.52	5 04.70	1.196	17 32 49.45
Tues.	16	17 32 10.15	+ 11.064	23 17 43.3	− 7.36	4 35.86	− 1.207	17 36 46.01
Wed.	17	17 36 35.80	11.074	23 20 25.9	6.19	4 06.77	1.217	17 40 42.57
Thur.	18	17 41 01.68	11.082	23 22 40.4	5.02	3 37.44	1.226	17 44 39.12
Frid.	19	17 45 27.74	+ 11.089	23 24 26.9	− 3.85	3 07.94	− 1.233	17 48 35.68
Sat.	20	17 49 53.98	11.096	23 25 45.2	2.67	2 38.26	1.239	17 52 32.24
SUN.	21	17 54 20.34	11.101	23 26 35.2	1.50	2 08.46	1.244	17 56 28.80
Mon.	22	17 58 46.80	+ 11.104	23 26 57.0	− 0.32	1 38.55	− 1.247	18 00 25.35
Tues.	23	18 03 13.32	11.106	23 26 50.5	+ 0.86	1 08.59	1.249	18 04 21.91
Wed.	24	18 07 39.86	11.106	23 26 15.7	2.04	0 38.61	1.249	18 08 18.47
Thur.	25	18 12 06.40	+ 11.105	23 25 12.7	+ 3.22	0 08.62	− 1.248	18 12 15.02
Frid.	26	18 16 32.88	11.102	23 23 41.3	4.39	0 21.30	1.245	18 16 11.58
Sat.	27	18 20 59.28	11.098	23 21 41.8	5.57	0 51.14	1.241	18 20 08.14
SUN.	28	18 25 25.56	+ 11.092	23 19 14.0	+ 6.74	1 20.86	− 1.235	18 24 04.70
Mon.	29	18 29 51.68	11.084	23 16 18.2	7.91	1 50.42	1.228	18 28 01.26
Tues.	30	18 34 17.60	11.075	23 12 54.5	9.07	2 19.79	1.219	18 31 57.81
Wed.	31	18 38 43.28	11.064	23 09 02.8	10.23	2 48.91	1.208	18 35 54.37
Thur.	32	18 43 08.70	+ 11.053	S. 23 04 43.3	+ 11.39	3 17.77	− 1.197	18 39 50.93

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 Hour,
+9.8565ˢ.
(Table III.)

		| AT GREENWICH MEAN NOON.						

		THE SUN'S						
Day of the Month.	Day of the Year.	TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		λ	λ'					
		° ′ ″	′ ″	″	″			h m s
1	335	248 22 42.3	21 50.5	152.14	+ 0.34	9.993 8370	− 29.1	7 21 09.87
2	336	249 23 34.3	22 42.3	152.19	0.39	9.993 7679	28.5	7 17 13.96
3	337	250 24 27.3	23 35.1	152.23	0.41	9.993 7001	27.9	7 13 18.05
4	338	251 25 21.3	24 28.9	152.27	+ 0.41	9.993 6338	− 27.3	7 09 22.14
5	339	252 26 16.1	25 23.6	152.30	0.37	9.993 5691	26.6	7 05 26.23
6	340	253 27 11.7	26 19.0	152.33	0.33	9.993 5060	25.9	7 01 30.32
7	341	254 28 08.0	27 15.2	152.36	+ 0.23	9.993 4448	− 25.1	6 57 34.41
8	342	255 29 05.1	28 12.1	152.39	0.13	9.993 3854	24.3	6 53 38.50
9	343	256 30 02.8	29 09.6	152.42	+ 0.01	9.993 3281	23.4	6 49 42.58
10	344	257 31 01.1	30 07.8	152.45	− 0.12	9.993 2730	− 22.5	6 45 46.67
11	345	258 32 00.0	31 06.5	152.47	0.27	9.993 2202	21.5	6 41 50.76
12	346	259 32 59.5	32 05.9	152.50	0.41	9.993 1699	20.4	6 37 54.85
13	347	260 33 59.6	33 05.8	152.52	− 0.53	9.993 1222	− 19.3	6 33 58.94
14	348	261 35 00.4	34 06.4	152.55	0.62	9.993 0773	18.2	6 30 03.03
15	349	262 36 01.8	35 07.6	152.57	0.70	9.993 0351	17.0	6 26 07.12
16	350	263 37 03.9	36 09.6	152.60	− 0.74	9.992 9958	− 15.8	6 22 11.21
17	351	264 38 06.8	37 12.3	152.64	0.76	9.992 9593	14.6	6 18 15.30
18	352	265 39 10.5	38 15.8	152.67	0.74	9.992 9256	13.5	6 14 19.38
19	353	266 40 15.0	39 20.2	152.71	− 0.70	9.992 8944	− 12.4	6 10 23.47
20	354	267 41 20.3	40 25.3	152.74	0.62	9.992 8658	11.4	6 06 27.56
21	355	268 42 26.5	41 31.3	152.77	0.52	9.992 8396	10.5	6 02 31.65
22	356	269 43 33.4	42 38.1	152.80	− 0.41	9.992 8157	− 9.6	5 58 35.74
23	357	270 44 41.1	43 45.6	152.83	0.28	9.992 7938	8.7	5 54 39.83
24	358	271 45 49.4	44 53.7	152.86	0.15	9.992 7740	7.9	5 50 43.92
25	359	272 46 58.3	46 02.5	152.88	− 0.04	9.992 7561	− 7.1	5 46 48.00
26	360	273 48 07.8	47 11.8	152.90	+ 0.06	9.992 7400	6.3	5 42 52.09
27	361	274 49 17.7	48 21.5	152.92	0.14	9.992 7258	5.6	5 38 56.18
28	362	275 50 27.9	49 31.5	152.93	+ 0.22	9.992 7133	− 4.8	5 35 00.27
29	363	276 51 38.4	50 41.9	152.94	0.27	9.992 7025	4.1	5 31 04.36
30	364	277 52 49.2	51 52.5	152.95	0.30	9.992 6935	3.4	5 27 08.45
31	365	278 54 00.0	53 03.1	152.95	0.29	9.992 6861	2.7	5 23 12.54
32	366	279 55 10.8	54 13.8	152.95	+ 0.26	9.992 6806	− 1.9	5 19 16.62

Diff. for 1 Hour,
− 9.8296ˢ.
(Table II.)

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' to the mean equinox of January 0.0ᵈ of the Besselian fictitious year.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 44.6	14 43.9	54 00.8	− 0.28	53 58.1	− 0.17	0 58.1	+ 1.99	1.4
2	14 43.6	14 43.6	53 56.8	− 0.04	53 57.1	+ 0.09	1 45.6	1.97	2.4
3	14 44.2	14 45.2	53 59.0	+ 0.24	54 02.8	0.40	2 32.4	1.93	3.4
4	14 46.8	14 48.9	54 08.5	+ 0.56	54 16.3	+ 0.74	3 18.3	+ 1.90	4.4
5	14 51.6	14 54.9	54 26.2	0.92	54 38.4	1.11	4 03.5	1.87	5.4
6	14 58.8	15 03.4	54 52.9	1.30	55 09.8	1.50	4 48.2	1.86	6.4
7	15 08.6	15 14.5	55 28.9	+ 1.68	55 50.3	+ 1.86	5 32.9	+ 1.87	7.4
8	15 20.9	15 27.8	56 13.7	2.03	56 39.2	2.19	6 18.2	1.92	8.4
9	15 35.2	15 42.9	57 06.2	2.31	57 34.7	2.40	7 05.1	2.00	9.4
10	15 50.9	15 59.0	58 04.0	+ 2.46	58 33.7	+ 2.47	7 54.4	+ 2.12	10.4
11	16 07.0	16 14.8	59 03.2	2.42	59 31.8	2.31	8 46.9	2.27	11.4
12	16 22.2	16 28.9	59 58.7	2.15	60 23.3	1.92	9 43.2	2.42	12.4
13	16 34.7	16 39.5	60 44.7	+ 1.63	61 02.4	+ 1.29	10 43.1	+ 2.56	13.4
14	16 43.1	16 45.4	61 15.7	0.90	61 24.0	+ 0.48	11 45.7	2.63	14.4
15	16 46.3	16 45.8	61 27.3	+ 0.05	61 25.4	− 0.37	12 49.0	2.62	15.4
16	16 43.9	16 40.6	61 18.3	− 0.78	61 06.6	1.16	13 51.0	+ 2.53	16.4
17	16 36.3	16 30.9	60 50.4	1.50	60 30.6	1.78	14 50.2	2.39	17.4
18	16 24.6	16 17.8	60 07.7	2.00	59 42.5	2.16	15 45.8	2.24	18.4
19	16 10.5	16 02.9	59 15.8	− 2.27	58 48.1	− 2.32	16 38.0	+ 2.11	19.4
20	15 55.3	15 47.8	58 20.1	2.31	57 52.6	2.28	17 27.4	2.02	20.4
21	15 40.4	15 33.4	57 25.5	2.20	56 59.6	2.10	18 14.8	1.95	21.4
22	15 26.7	15 20.5	56 35.2	− 1.97	56 12.3	− 1.83	19 01.2	+ 1.92	22.4
23	15 14.7	15 09.5	55 51.2	1.68	55 32.0	1.53	19 47.2	1.92	23.4
24	15 04.8	15 00.5	55 14.6	1.37	54 59.1	1.21	20 33.4	1.93	24.4
25	14 56.8	14 53.6	54 45.5	− 1.06	54 33.7	− 0.91	21 20.0	+ 1.95	25.4
26	14 50.9	14 48.5	54 23.6	0.77	54 15.1	0.64	22 07.2	1.97	26.4
27	14 46.7	14 45.2	54 08.2	0.51	54 02.8	0.39	22 54.8	1.98	27.4
28	14 44.1	14 43.4	53 58.8	− 0.28	53 56.1	− 0.17	23 42.4	+ 1.97	28.4
29	14 43.0	14 43.0	53 54.7	− 0.06	53 54.6	+ 0.05	☽		29.4
30	14 43.3	14 44.0	53 55.8	+ 0.15	53 58.3	0.26	0 29.6	1.95	0.6
31	14 45.0	14 46.4	54 02.1	0.37	54 07.3	0.49	1 16.0	1.92	1.6
32	14 48.2	14 50.4	54 13.8	+ 0.61	54 21.9	+ 0.74	2 01.6	+ 1.88	2.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.

MONDAY 1.

	h m s		s	° ′ ″	″		h m s		s	° ′ ″	″
0	17 33 49.98	+ 2.0891	S.18 53 37.5	+ 0.007
1	17 35 55.31	2.0886	18 53 34.5	0.093
2	17 38 00.61	2.0880	18 53 26.3	0.180
3	17 40 05.87	2.0875	18 53 12.9	0.267
4	17 42 11.11	2.0870	18 52 54.3	0.354
5	17 44 16.31	2.0863	18 52 30.4	0.442
6	17 46 21.47	2.0857	18 52 01.3	0.528
7	17 48 26.59	2.0851	18 51 27.0	0.614
8	17 50 31.68	2.0844	18 50 47.6	0.701
9	17 52 36.72	2.0837	18 50 02.9	0.787
10	17 54 41.73	2.0831	18 49 13.1	0.874
11	17 56 46.69	2.0822	18 48 18.0	0.961
12	17 58 51.60	2.0815	18 47 17.8	1.046
13	18 00 56.47	2.0807	18 46 12.5	1.132
14	18 03 01.29	2.0799	18 45 02.0	1.218
15	18 05 06.06	2.0791	18 43 46.3	1.303
16	18 07 10.78	2.0782	18 42 25.6	1.388
17	18 09 15.45	2.0773	18 40 59.7	1.474
18	18 11 20.06	2.0764	18 39 28.7	1.559
19	18 13 24.62	2.0755	18 37 52.6	1.644
20	18 15 29.12	2.0746	18 36 11.4	1.728
21	18 17 33.57	2.0736	18 34 25.2	1.813
22	18 19 37.95	2.0726	18 32 33.8	1.898
23	18 21 42.28	+ 2.0716	S.18 30 37.4	+ 1.982

TUESDAY 2.

0	18 23 46.54	+ 2.0705	S.18 28 36.0	+ 2.066
1	18 25 50.74	2.0695	18 26 29.5	2.149
2	18 27 54.88	2.0684	18 24 18.1	2.233
3	18 29 58.95	2.0673	18 22 01.6	2.317
4	18 32 02.96	2.0662	18 19 40.1	2.399
5	18 34 06.90	2.0651	18 17 13.7	2.482
6	18 36 10.77	2.0639	18 14 42.3	2.564
7	18 38 14.57	2.0627	18 12 06.0	2.647
8	18 40 18.30	2.0616	18 09 24.7	2.729
9	18 42 21.96	2.0604	18 06 38.5	2.811
10	18 44 25.55	2.0592	18 03 47.4	2.892
11	18 46 29.06	2.0579	18 00 51.5	2.973
12	18 48 32.50	2.0567	17 57 50.6	3.055
13	18 50 35.87	2.0555	17 54 44.9	3.135
14	18 52 39.16	2.0542	17 51 34.4	3.215
15	18 54 42.38	2.0530	17 48 19.1	3.295
16	18 56 45.52	2.0517	17 44 59.0	3.375
17	18 58 48.59	2.0504	17 41 34.1	3.455
18	19 00 51.57	2.0491	17 38 04.4	3.534
19	19 02 54.48	2.0478	17 34 30.0	3.613
20	19 04 57.31	2.0465	17 30 50.8	3.692
21	19 07 00.06	2.0452	17 27 07.0	3.770
22	19 09 02.73	2.0438	17 23 18.4	3.848
23	19 11 05.32	2.0425	17 19 25.2	3.926
24	19 13 07.83	+ 2.0412	S.17 15 27.3	+ 4.003

WEDNESDAY 3.

0	19 13 07.83	+ 2.0412	S.17 15 27.3	+ 4.003
1	19 15 10.26	2.0397	17 11 24.8	4.080
2	19 17 12.60	2.0384	17 07 17.7	4.157
3	19 19 14.87	2.0371	17 03 06.0	4.233
4	19 21 17.05	2.0356	16 58 49.7	4.309
5	19 23 19.14	2.0342	16 54 28.9	4.384
6	19 25 21.16	2.0329	16 50 03 6	4.460
7	19 27 23.09	2.0314	16 45 33.7	4.535
8	19 29 24.93	2.0301	16 40 59.4	4.609
9	19 31 26.70	2.0287	16 36 20.6	4.684
10	19 33 28.38	2.0273	16 31 37.3	4.758
11	19 35 29.98	2.0259	16 26 49.6	4.832
12	19 37 31.49	2.0245	16 21 57.5	4.905
13	19 39 32.92	2.0232	16 17 01.0	4.977
14	19 41 34.27	2.0217	16 12 00.2	5.050
15	19 43 35.53	2.0203	16 06 55.0	5.122
16	19 45 36.71	2.0189	16 01 45.5	5.193
17	19 47 37.80	2.0176	15 56 31.8	5.264
18	19 49 38.82	2.0162	15 51 13.8	5.336
19	19 51 39.75	2.0148	15 45 51.5	5.407
20	19 53 40.60	2.0135	15 40 25.0	5.477
21	19 55 41.37	2.0122	15 34 54.3	5.547
22	19 57 42.06	2.0107	15 29 19.4	5.616
23	19 59 42.66	+ 2.0094	S.15 23 40.4	+ 5.685

THURSDAY 4.

0	20 01 43.19	+ 2.0082	S.15 17 57.2	+ 5.754
1	20 03 43.64	2.0068	15 12 09.9	5.822
2	20 05 44.01	2.0055	15 06 18.6	5.889
3	20 07 44.30	2.0042	15 00 23.2	5.957
4	20 09 44.51	2.0029	14 54 23.8	6.023
5	20 11 44.65	2.0017	14 48 20.4	6.090
6	20 13 44.71	2.0003	14 42 13.0	6.157
7	20 15 44.69	1.9991	14 36 01.6	6.222
8	20 17 44.60	1.9978	14 29 46.3	6.287
9	20 19 44.43	1.9966	14 23 27.1	6.352
10	20 21 44.19	1.9954	14 17 04.0	6.417
11	20 23 43.88	1.9942	14 10 37.0	6.481
12	20 25 43.49	1.9930	14 04 06.3	6.544
13	20 27 43.04	1.9918	13 57 31.7	6.608
14	20 29 42.51	1.9907	13 50 53.3	6.671
15	20 31 41.92	1.9897	13 44 11.2	6.733
16	20 33 41.27	1.9885	13 37 25.3	6.795
17	20 35 40.54	1.9873	13 30 35.8	6.857
18	20 37 39.75	1.9863	13 23 42.5	6.918
19	20 39 38.90	1.9853	13 16 45.6	6.978
20	20 41 37.99	1.9842	13 09 45.1	7.038
21	20 43 37.01	1.9832	13 02 41.0	7.098
22	20 45 35.97	1.9822	12 55 33.3	7.158
23	20 47 34.87	1.9812	12 48 22.0	7.217
24	20 49 33.72	+ 1.9803	S.12 41 07.2	+ 7.276

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 5.					SUNDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 49 33.72	+ 1.9803	S.12 41 07.2	+ 7.276	0	22 24 06.65	+ 1.9732	S. 5 53 07.0	+ 9.541
1	20 51 32.51	1.9794	12 33 48.9	7.334	1	22 26 05.07	1.9742	5 43 33.5	9.577
2	20 53 31.25	1.9785	12 26 27.1	7.392	2	22 28 03.55	1.9751	5 33 57.8	9.612
3	20 55 29.93	1.9776	12 19 01.9	7.448	3	22 30 02.08	1.9759	5 24 20.1	9.645
4	20 57 28.56	1.9768	12 11 33.3	7.506	4	22 32 00.66	1.9769	5 14 40.4	9.678
5	20 59 27.15	1.9760	12 04 01.2	7.562	5	22 33 59.31	1.9780	5 04 58.7	9.712
6	21 01 25.68	1.9752	11 56 25.8	7.617	6	22 35 58.02	1.9791	4 55 15.0	9.744
7	21 03 24.17	1.9745	11 48 47.1	7.672	7	22 37 56.80	1.9802	4 45 29.4	9.776
8	21 05 22.62	1.9737	11 41 05.1	7.728	8	22 39 55.64	1.9813	4 35 41.9	9.807
9	21 07 21.02	1.9730	11 33 19.7	7.783	9	22 41 54.56	1.9827	4 25 52.6	9.837
10	21 09 19.38	1.9723	11 25 31.1	7.837	10	22 43 53.56	1.9840	4 16 01.4	9.867
11	21 11 17.70	1.9717	11 17 39.3	7.889	11	22 45 52.64	1.9852	4 06 08.5	9.897
12	21 13 15.98	1.9711	11 09 44.4	7.942	12	22 47 51.79	1.9866	3 56 13.8	9.926
13	21 15 14.23	1.9705	11 01 46.2	7.996	13	22 49 51.03	1.9881	3 46 17.4	9.954
14	21 17 12.44	1.9699	10 53 44.9	8.048	14	22 51 50.36	1.9896	3 36 19.3	9.982
15	21 19 10.62	1.9694	10 45 40.4	8.100	15	22 53 49.78	1.9911	3 26 19.6	10.009
16	21 21 08.77	1.9689	10 37 32.9	8.151	16	22 55 49.29	1.9927	3 16 18.2	10.036
17	21 23 06.89	1.9685	10 29 22.3	8.202	17	22 57 48.90	1.9943	3 06 15.3	10.062
18	21 25 04.99	1.9681	10 21 08.6	8.252	18	22 59 48.61	1.9960	2 56 10.8	10.087
19	21 27 03.06	1.9677	10 12 52.0	8.302	19	23 01 48.42	1.9977	2 46 04.8	10.112
20	21 29 01.11	1.9672	10 04 32.3	8.352	20	23 03 48.34	1.9996	2 35 57.4	10.136
21	21 30 59.13	1.9669	9 56 09.7	8.401	21	23 05 48.37	2.0014	2 25 48.5	10.160
22	21 32 57.14	1.9667	9 47 44.2	8.449	22	23 07 48.51	2.0033	2 15 38.2	10.183
23	21 34 55.14	+ 1.9665	S. 9 39 15.8	+ 8.497	23	23 09 48.77	+ 2.0053	S. 2 05 26.5	+ 10.206
	SATURDAY 6.					MONDAY 8.			
0	21 36 53.12	+ 1.9662	S. 9 30 44.5	+ 8.545	0	23 11 49.15	+ 2.0073	S. 1 55 13.5	+ 10.227
1	21 38 51.09	1.9661	9 22 10.4	8.592	1	23 13 49.65	2.0094	1 44 59.3	10.247
2	21 40 49.05	1.9659	9 13 33.4	8.640	2	23 15 50.28	2.0116	1 34 43.8	10.268
3	21 42 47.00	1.9658	9 04 53.6	8.686	3	23 17 51.04	2.0137	1 24 27.1	10.288
4	21 44 44.95	1.9658	8 56 11.1	8.732	4	23 19 51.93	2.0159	1 14 09.2	10.307
5	21 46 42.90	1.9657	8 47 25.8	8.777	5	23 21 52.95	2.0182	1 03 50.3	10.325
6	21 48 40.84	1.9657	8 38 37.9	8.821	6	23 23 54.12	2.0207	0 53 30.2	10.343
7	21 50 38.79	1.9658	8 29 47.3	8.866	7	23 25 55.43	2.0230	0 43 09.1	10.360
8	21 52 36.74	1.9659	8 20 54.0	8.910	8	23 27 56.88	2.0254	0 32 47.0	10.377
9	21 54 34.70	1.9661	8 11 58.1	8.952	9	23 29 58.48	2.0280	0 22 23.9	10.392
10	21 56 32.67	1.9662	8 02 59.7	8.995	10	23 32 00.24	2.0306	0 11 59.9	10.407
11	21 58 30.65	1.9664	7 53 58.7	9.038	11·	23 34 02.15	2.0332	S. 0 01 35.1	10.420
12	22 00 28.64	1.9667	7 44 55.1	9.080	12	23 36 04.22	2.0358	N. 0 08 50.5	10.433
13	22 02 26.65	1.9670	7 35 49.1	9.121	13	23 38 06.45	2.0386	0 19 16.9	10.447
14	22 04 24.68	1.9673	7 26 40.6	9.162	14	23 40 08.85	2.0413	0 29 44.1	10.459
15	22 06 22.73	1.9677	7 17 29.7	9.202	15	23 42 11.41	2.0442	0 40 12.0	10.471
16	22 08 20.81	1.9682	7 08 16.3	9.242	16	23 44 14.15	2.0472	0 50 40.6	10.481
17	22 10 18.92	1.9687	6 59 00.6	9.281	17	23 46 17.07	2.0501	1 01 09.7	10.490
18	22 12 17.05	1.9692	6 49 42.6	9.320	18	23 48 20.16	2.0531	1 11 39.4	10.499
19	22 14 15.22	1.9698	6 40 22.2	9.358	19	23 50 23.44	2.0562	1 22 09.6	10.507
20	22 16 13.43	1.9704	6 30 59.6	9.396	20	23 52 26.90	2.0593	1 32 40.3	10.515
21	22 18 11.67	1.9710	6 21 34.7	9.432	21	23 54 30.55	2.0625	1 43 11.4	10.522
22	22 20 09.95	1.9717	6 12 07.7	9.469	22	23 56 34.40	2.0657	1 53 42.9	10.527
23	22 22 08.28	1.9725	6 02 38.4	9.506	23	23 58 38.44	2.0690	2 04 14.7	10.532
24	22 24 06.65	+ 1.9732	S. 5 53 07.0	+ 9.541	24	0 00 42.68	+ 2.0724	N. 2 14 46.8	+ 10.537

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 9.					THURSDAY 11.			
	h m s		° ′ ″	″		h m s		° ′ ″	″
0	0 00 42.68	+ 2.0724	N. 2 14 46.8	+ 10.537	0	1 45 04.83	+ 2.2950	N.10 27 30.5	+ 9.584
1	0 02 47.13	2.0758	2 25 19.1	10.540	1	1 47 22.70	2.3007	10 37 04.1	9.536
2	0 04 51.78	2.0792	2 35 51.6	10.542	2	1 49 40.92	2.3065	10 46 34.8	9.487
3	0 06 56.64	2.0827	2 46 24.2	10.543	3	1 51 59.48	2.3122	10 56 02.5	9.436
4	0 09 01.71	2.0863	2 56 56.8	10.544	4	1 54 18.39	2.3181	11 05 27.1	9.384
5	0 11 07.00	2.0900	3 07 29.5	10.545	5	1 56 37.65	2.3238	11 14 48.6	9.331
6	0 13 12.51	2.0937	3 18 02.2	10.544	6	1 58 57.25	2.3296	11 24 06.8	9.275
7	0 15 18.25	2.0975	3 28 34.8	10.542	7	2 01 17.20	2.3355	11 33 21.6	9.219
8	0 17 24.21	2.1013	3 39 07.2	10.539	8	2 03 37.51	2.3413	11 42 33.1	9.162
9	0 19 30.41	2.1052	3 49 39.5	10.537	9	2 05 58.16	2.3472	11 51 41.1	9.103
10	0 21 36.83	2.1090	4 00 11.6	10.532	10	2 08 19.17	2.3531	12 00 45.5	9.043
11	0 23 43.49	2.1131	4 10 43.3	10.526	11	2 10 40.53	2.3590	12 09 46.3	8.982
12	0 25 50.40	2.1172	4 21 14.7	10.520	12	2 13 02.25	2.3649	12 18 43.3	8.918
13	0 27 57.55	2.1212	4 31 45.7	10.512	13	2 15 24.32	2.3708	12 27 36.5	8.854
14	0 30 04.94	2.1252	4 42 16.2	10.504	14	2 17 46.75	2.3768	12 36 25.8	8.789
15	0 32 12.58	2.1295	4 52 46.2	10.495	15	2 20 09.54	2.3828	12 45 11.2	8.722
16	0 34 20.48	2.1338	5 03 15.6	10.485	16	2 22 32.69	2.3887	12 53 52.4	8.652
17	0 36 28.64	2.1381	5 13 44.4	10.473	17	2 24 56.19	2.3947	13 02 29.5	8.582
18	0 38 37.05	2.1423	5 24 12.4	10.461	18	2 27 20.05	2.4007	13 11 02.3	8.511
19	0 40 45.72	2.1467	5 34 39.7	10.448	19	2 29 44.27	2.4067	13 19 30.8	8.438
20	0 42 54.66	2.1513	5 45 06.2	10.435	20	2 32 08.85	2.4127	13 27 54.9	8.364
21	0 45 03.88	2.1558	5 55 31.9	10.420	21	2 34 33.79	2.4187	13 36 14.5	8.288
22	0 47 13.36	2.1603	6 05 56.6	10.403	22	2 36 59.09	2.4247	13 44 29.5	8.211
23	0 49 23.12	+ 2.1649	N. 6 16 20.2	+ 10.385	23	2 39 24.75	+ 2.4306	N.13 52 39.8	+ 8.132
	WEDNESDAY 10.					FRIDAY 12.			
0	0 51 33.15	+ 2.1696	N. 6 26 42.8	+ 10.367	0	2 41 50.76	+ 2.4365	N.14 00 45.4	+ 8.053
1	0 53 43.47	2.1743	6 37 04.3	10.347	1	2 44 17.13	2.4424	14 08 46.2	7.972
2	0 55 54.07	2.1791	6 47 24.5	10.327	2	2 46 43.85	2.4483	14 16 42.0	7.888
3	0 58 04.96	2.1839	6 57 43.5	10.306	3	2 49 10.93	2.4543	14 24 32.8	7.804
4	1 00 16.14	2.1887	7 08 01.2	10.283	4	2 51 38.37	2.4602	14 32 18.5	7.718
5	1 02 27.61	2.1937	7 18 17.5	10.259	5	2 54 06.15	2.4660	14 39 59.0	7.631
6	1 04 39.38	2.1987	7 28 32.3	10.234	6	2 56 34.29	2.4719	14 47 34.2	7.542
7	1 06 51.45	2.2037	7 38 45.6	10.208	7	2 59 02.78	2.4777	14 55 04.1	7.452
8	1 09 03.82	2.2087	7 48 57.3	10.182	8	3 01 31.61	2.4835	15 02 28.5	7.361
9	1 11 16.49	2.2138	7 59 07.4	10.154	9	3 04 00.80	2.4893	15 09 47.4	7.268
10	1 13 29.48	2.2190	8 09 15.8	10.124	10	3 06 30.33	2.4950	15 17 00.7	7.174
11	1 15 42.77	2.2241	8 19 22.3	16.093	11	3 09 00.20	2.5007	15 24 08.3	7.078
12	1 17 56.37	2.2293	8 29 27.0	10.062	12	3 11 30.41	2.5063	15 31 10.1	6.982
13	1 20 10.29	2.2346	8 39 29.7	10.028	13	3 14 00.96	2.5121	15 38 06.1	6.883
14	1 22 24.52	2.2399	8 49 30.4	9.994	14	3 16 31.86	2.5177	15 44 56.1	6.783
15	1 24 39.08	2.2452	8 59 29.0	9.959	15	3 19 03.08	2.5232	15 51 40.0	6.682
16	1 26 53.95	2.2506	9 09 25.5	9.922	16	3 21 34.64	2.5287	15 58 17.9	6.579
17	1 29 09.15	2.2561	9 19 19.7	9.884	17	3 24 06.52	2.5341	16 04 49.5	6.475
18	1 31 24.68	2.2616	9 29 11.6	9.845	18	3 26 38.73	2.5396	16 11 14.9	6.370
19	1 33 40.54	2.2671	9 39 01.1	9.805	19	3 29 11.27	2.5449	16 17 33.9	6.262
20	1 35 56.73	2.2726	9 48 48.2	9.764	20	3 31 44.12	2.5502	16 23 46.4	6.155
21	1 38 13.25	2.2781	9 58 32.8	9.721	21	3 34 17.29	2.5554	16 29 52.5	6.046
22	1 40 30.10	2.2837	10 08 14.7	9.677	22	3 36 50.77	2.5606	16 35 51.9	5.935
23	1 42 47.30	2.2894	10 17 54.0	9.632	23	3 39 24.56	2.5657	16 41 44.7	5.823
24	1 45 04.83	+ 2.2950	N.10 27 30.5	+ 9.584	24	3 41 58.65	+ 2.5707	N.16 47 30.7	+ 5.710

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 13.					MONDAY 15.			

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 41 58.65	+ 2.5707	N.16 47 30.7	+ 5.710	0	5 49 26.13	+ 2.6958	N.18 51 59.9	− 0.781
1	3 44 33.05	2.5757	16 53 09.9	5.596	1	5 52 07.87	2.6954	18 51 08.7	0.927
2	3 47 07.74	2.5807	16 58 42.2	5.480	2	5 54 49.58	2.6948	18 50 08.7	1.072
3	3 49 42.73	2.5855	17 04 07.5	5.362	3	5 57 31.25	2.6942	18 49 00.1	1.216
4	3 52 18.00	2.5902	17 09 25.7	5.245	4	6 00 12.88	2.6933	18 47 42.8	1.360
5	3 54 53.56	2.5950	17 14 36.9	5.126	5	6 02 54.45	2.6923	18 46 16.9	1.504
6	3 57 29.40	2.5996	17 19 40.8	5.004	6	6 05 35.96	2.6912	18 44 42.3	1.648
7	4 00 05.51	2.6041	17 24 37.4	4.883	7	6 08 17.40	2.6901	18 42 59.1	1.792
8	4 02 41.89	2.6086	17 29 26.8	4.761	8	6 10 58.77	2.6887	18 41 07.3	1.935
9	4 05 18.54	2.6130	17 34 08.7	4.637	9	6 13 40.05	2.6872	18 39 06.9	2.077
10	4 07 55.45	2.6172	17 38 43.2	4.512	10	6 16 21.23	2.6855	18 36 58.0	2.219
11	4 10 32.61	2.6213	17 43 10.1	4.385	11	6 19 02.31	2.6838	18 34 40.6	2.361
12	4 13 10.01	2.6254	17 47 29.4	4.258	12	6 21 43.29	2.6820	18 32 14.7	2.502
13	4 15 47.66	2.6295	17 51 41.1	4.130	13	6 24 24.15	2.6799	18 29 40.3	2.643
14	4 18 25.55	2.6334	17 55 45.0	4.001	14	6 27 04.88	2.6778	18 26 57.5	2.783
15	4 21 03.67	2.6372	17 59 41.2	3.871	15	6 29 45.49	2.6756	18 24 06.3	2.922
16	4 23 42.01	2.6408	18 03 29.5	3.739	16	6 32 25.95	2.6732	18 21 06.8	3.061
17	4 26 20.57	2.6444	18 07 09.9	3.607	17	6 35 06.27	2.6707	18 17 59.0	3.199
18	4 28 59.34	2.6479	18 10 42.4	3.474	18	6 37 46.44	2.6682	18 14 42.9	3.337
19	4 31 38.32	2.6513	18 14 06.8	3.340	19	6 40 26.45	2.6654	18 11 18.6 •	3.473
20	4 34 17.50	2.6546	18 17 23.2	3.206	20	6 43 06.29	2.6626	18 07 46.1	3.609
21	4 36 56.87	2.6577	18 20 31.5	3.071	21	6 45 45.96	2.6597	18 04 05.5	3.744
22	4 39 36.43	2.6608	18 23 31.7	2.934	22	6 48 25.45	2.6567	18 00 16.8	3.878
23	4 42 16.17	+ 2.6637	N.18 26 23.6	+ 2.797	23	6 51 04.76	+ 2.6535	N.17 56 20.1	− 4.011

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 14.					TUESDAY 16.			
0	4 44 56.08	+ 2.6666	N.18 29 07.3	+ 2.659	0	6 53 43.87	+ 2.6502	N.17 52 15.5	− 4.143
1	4 47 36.16	2.6692	18 31 42.7	2.521	1	6 56 22.78	2.6468	17 48 02.9	4.275
2	4 50 16.39	2.6717	18 34 09.8	2.382	2	6 59 01.49	2.6434	17 43 42.5	4.405
3	4 52 56.77	2.6742	18 36 28.5	2.242	3	7 01 39.99	2.6397	17 39 14.3	4.535
4	4 55 37.30	2.6767	18 38 38.8	2.102	4	7 04 18.26	2.6361	17 34 38.3	4.664
5	4 58 17.97	2.6788	18 40 40.7	1.960	5	7 06 56.32	2.6324	17 29 54.6	4.791
6	5 00 58.76	2.6808	18 42 34.0	1.818	6	7 09 34.15	2.6285	17 25 03.4	4.917
7	5 03 39.67	2.6828	18 44 18.9	1.677	7	7 12 11.74	2.6245	17 20 04.6	5.042
8	5 06 20.70	2.6847	18 45 55.2	1.534	8	7 14 49.09	2.6205	17 14 58.3	5.167
9	5 09 01.84	2.6864	18 47 23.0	1.392	9	7 17 26.20	2.6164	17 09 44.5	5.291
10	5 11 43.07	2.6879	18 48 42.2	1.248	10	7 20 03.06	2.6122	17 04 23.4	5.412
11	5 14 24.39	2.6894	18 49 52.8	1.104	11	7 22 39.67	2.6079	16 58 55.0	5.533
12	5 17 05.80	2.6907	18 50 54.7	0.960	12	7 25 16.01	2.6035	16 53 19.4	5.652
13	5 19 47.28	2.6918	18 51 48.0	0.816	13	7 27 52.09	2.5991	16 47 36.7	5.771
14	5 22 28.82	2.6928	18 52 32.6	0.671	14	7 30 27.90	2.5945	16 41 46.9	5.888
15	5 25 10.42	2.6937	18 53 08.5	0.527	15	7 33 03.43	2.5899	16 35 50.1	6.005
16	5 27 52.07	2.6946	18 53 35.8	0.382	16 ·	7 35 38.69	2.5853	16 29 46.3	6.119
17	5 30 33.77	2.6952	18 53 54.3	0.236	17	7 38 13.67	2.5806	16 23 35.8	6.232
18	5 33 15.50	2.6957	18 54 04.1	+ 0.091	18	7 40 48.36	2.5757	16 17 18.5	6.344
19	5 35 57.25	2.6960	18 54 05.2	− 0.054	19	7 43 22.76	2.5709	16 10 54.5	6.456
20	5 38 39.02	2.6962	18 53 57.6	0.200	20	7 45 56.87	2.5660	16 04 23.8	6.565
21	5 41 20.80	2.6964	18 53 41.2	0.345	21	7 48 30.68	2.5610	15 57 46.7	6.673
22	5 44 02.59	2.6964	18 53 16.2	0.490	22	7 51 04.19	2.5560	15 51 03.1	6.780
23	5 46 44.37	2.6962	18 52 42.4	0.636	23	7 53 37.40	2.5509	15 44 13.1	6.885
24	5 49 26.13	+ 2.6958	N.18 51 59.9	− 0.781	24	7 56 10.30	+ 2.5457	N.15 37 16.9	− 6.989

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 17.

Hour.	Right Ascension.	Diff for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	′
0	7 56 10.30	+ 2.5457	N.15 37 16.9	− 6.989
1	7 58 42.89	2.5405	15 30 14.4	7.092
2	8 01 15.16	2.5352	15 23 05.8	7.193
3	8 03 47.12	2.5300	15 15 51.2	7.292
4	8 06 18.76	2.5247	15 08 30.7	7.392
5	8 08 50.09	2.5194	15 01 04.2	7.489
6	8 11 21.09	2.5139	14 53 32.0	7.584
7	8 13 51.76	2.5085	14 45 54.1	7.678
8	8 16 22.11	2.5031	14 38 10.6	7.772
9	8 18 52.13	2.4976	14 30 21.5	7.863
10	8 21 21.82	2.4921	14 22 27.0	7.952
11	8 23 51.18	2.4866	14 14 27.2	8.041
12	8 26 20.21	2.4810	14 06 22.1	8.128
13	8 28 48.90	2.4754	13 58 11.8	8.214
14	8 31 17.26	2.4698	13 49 56.4	8.297
15	8 33 45.28	2.4642	13 41 36.1	8.380
16	8 36 12.96	2.4586	13 33 10.8	8.462
17	8 38 40.31	2.4529	13 24 40.6	8.542
18	8 41 07.31	2.4472	13 16 05.8	8.619
19	8 43 33.98	2.4417	13 07 26.3	8.697
20	8 46 00.31	2.4360	12 58 42.2	8.772
21	8 48 26.30	2.4302	12 49 53.6	8.846
22	8 50 51.94	2.4246	12 41 00.7	8.918
23	8 53 17.25	+ 2.4190	N.12 32 03.4	− 8.989

THURSDAY 18.

Hour.	Right Ascension.	Diff for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 55 42.22	+ 2.4133	N.12 23 02.0	− 9.058
1	8 58 06.85	2.4076	12 13 56.4	9.127
2	9 00 31.13	2.4019	12 04 46.8	9.193
3	9 02 55.08	2.3963	11 55 33.2	9.259
4	9 05 18.69	2.3907	11 46 15.7	9.322
5	9 07 41.97	2.3851	11 36 54.5	9.384
6	9 10 04.90	2.3794	11 27 29.6	9.446
7	9 12 27.50	2.3739	11 18 01.0	9.505
8	9 14 49.77	2.3683	11 08 29.0	9.563
9	9 17 11.70	2.3627	10 58 53.5	9.620
10	9 19 33.30	2.3572	10 49 14.6	9.675
11	9 21 54.56	2.3517	10 39 32.5	9.728
12	9 24 15.50	2.3462	10 29 47.2	9.781
13	9 26 36.11	2.3407	10 19 58.8	9.832
14	9 28 56.39	2.3352	10 10 07.4	9.882
15	9 31 16.34	2.3298	10 00 13.0	9.930
16	9 33 35.97	2.3244	9 50 15.8	9.977
17	9 35 55.27	2.3190	9 40 15.8	10.022
18	9 38 14.25	2.3137	9 30 13.1	10.067
19	9 40 32.92	2.3085	9 20 07.8	10.109
20	9 42 51.27	2.3032	9 10 00.0	10.151
21	9 45 09.30	2.2979	8 59 49.7	10.192
22	9 47 27.02	2.2927	8 49 37.0	10.230
23	9 49 44.42	2.2875	8 39 22.1	10.267
24	9 52 01.52	+ 2.2824	N. 8 29 04.9	− 10.304

FRIDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° · ″	″
0	9 52 01.52	+ 2.2824	N. 8 29 04.9	− 10.304
1	9 54 18.31	2.2773	8 18 45.6	10.339
2	9 56 34.80	2.2722	8 08 24.2	10.372
3	9 58 50.98	2.2672	7 58 00.9	10.405
4	10 01 06.87	2.2622	7 47 35.6	10.437
5	10 03 22.45	2.2573	7 37 08.5	10.467
6	10 05 37.74	2.2525	7 26 39.6	10.495
7	10 07 52.75	2.2477	7 16 09.1	10.522
8	10 10 07.46	2.2428	7 05 36.9	10.549
9	10 12 21.88	2.2380	6 55 03.2	10.574
10	10 14 36.02	2.2332	6 44 28.0	10.597
11	10 16 49.87	2.2286	6 33 51.5	10.620
12	10 19 03.45	2.2240	6 23 13.6	10.642
13	10 21 16.75	2.2194	6 12 34.4	10.662
14	10 23 29.78	2.2149	6 01 54.1	10.682
15	10 25 42.54	2.2105	5 51 12.6	10.700
16	10 27 55.04	2.2061	5 40 30.1	10.717
17	10 30 07.27	2.2017	5 29 46.5	10.733
18	10 32 19.24	2.1973	5 19 02.1	10.748
19	10 34 30.95	2.1930	5 08 16.8	10.762
20	10 36 42.40	2.1888	4 57 30.7	10.774
21	10 38 53.60	2.1847	4 46 43.9	10.785
22	10 41 04.56	2.1806	4 35 56.5	10.796
23	10 43 15.27	+ 2.1764	N. 4 25 08.4	− 10.805

SATURDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 45 25.73	+ 2.1724	N. 4 14 19.9	− 10.813
1	10 47 35.96	2.1685	4 03 30.9	10.821
2	10 49 45.95	2.1645	3 52 41.4	10.827
3	10 51 55.70	2.1607	3 41 51.6	10.832
4	10 54 05.23	2.1569	3 31 01.5	10.837
5	10 56 14.53	2.1531	3 20 11.2	10.840
6	10 58 23.60	2.1494	3 09 20.7	10.842
7	11 00 32.46	2.1458	2 58 30.1	10.843
8	11 02 41.10	2.1422	2 47 39.5	10.843
9	11 04 49.52	2.1386	2 36 48.9	10.843
10	11 06 57.73	2.1352	2 25 58.3	10.842
11	11 09 05.74	2.1317	2 15 07.9	10.838
12	11 11 13.54	2.1283	2 04 17.7	10.835
13	11 13 21.14	2.1251	1 53 27.7	10.831
14	11 15 28.55	2.1218	1 42 38.0	10.826
15	11 17 35.76	2.1186	1 31 48.6	10.820
16	11 19 42.78	2.1154	1 20 59.6	10.812
17	11 21 49.61	2.1123	1 10 11.1	10.804
18	11 23 56.26	2.1093	0 59 23.1	10.796
19	11 26 02.73	2.1063	0 48 35.6	10.786
20	11 28 09.02	2.1034	0 37 48.8	10.775
21	11 30 15.14	2.1005	0 27 02.6	10.764
22	11 32 21.08	2.0977	0 16 17.1	10.752
23	11 34 26.86	2.0950	N. 0 05 32.4	10.739
24	11 36 32.48	+ 2.0922	S. 0 05 11.6	− 10.726

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 21.					**TUESDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 36 32.48	+ 2.0922	S. 0 05 11.6	– 10.726	0	13 14 50.38	+ 2.0222	S. 8 09 59.6	– 9.221
1	11 38 37.93	2.0896	0 15 54.7	10.710	1	13 16 51.70	2.0218	8 19 11.5	9.175
2	11 40 43.23	2.0870	0 26 36.8	10.694	2	13 18 53.00	2.0216	8 28 20.6	9.127
3	11 42 48.37	2.0844	0 37 18.0	10.678	3	13 20 54.29	2.0213	8 37 26.8	9.080
4	11 44 53.36	2.0819	0 47 58.2	10.661	4	13 22 55.56	2.0211	8 46 30.2	9.032
5	11 46 58.20	2.0795	0 58 37.3	10.643	5	13 24 56.82	2.0208	8 55 30.7	8.983
6	11 49 02.90	2.0771	1 09 15.4	10.625	6	13 26 58.06	2.0207	9 04 28.2	8.934
7	11 51 07.45	2.0748	1 19 52.3	10.605	7	13 28 59.30	2.0206	9 13 22.8	8.885
8	11 53 11.87	2.0726	1 30 28.0	10.585	8	13 31 00.53	2.0205	9 22 14.4	8.834
9	11 55 16.16	2.0703	1 41 02.5	10.564	9	13 33 01.76	2.0205	9 31 02.9	8.783
10	11 57 20.31	2.0681	1 51 35.7	10.542	10	13 35 02.99	2.0204	9 39 48.4	8.732
11	11 59 24.33	2.0660	2 02 07.6	10.520	11	13 37 04.21	2.0204	9 48 30.7	8.680
12	12 01 28.23	2.0639	2 12 38.1	10.497	12	13 39 05.44	2.0205	9 57 10.0	8.628
13	12 03 32.00	2.0619	2 23 07.2	10.472	13	13 41 06.67	2.0206	10 05 46.1	8.575
14	12 05 35.66	2.0600	2 33 34.8	10.448	14	13 43 07.91	2.0207	10 14 19.0	8.522
15	12 07 39.20	2.0581	2 44 01.0	10.423	15	13 45 09.16	2.0208	10 22 48.7	8.468
16	12 09 42.63	2.0562	2 54 25.6	10.397	16	13 47 10.41	2.0210	10 31 15.2	8.414
17	12 11 45.94	2.0543	3 04 48.6	10.370	17	13 49 11.68	2.0212	10 39 38.4	8.359
18	12 13 49.15	2.0527	3 15 10.0	10.342	18	13 51 12.96	2.0215	10 47 58.3	8.303
19	12 15 52.26	2.0510	3 25 29.7	10.314	19	13 53 14.26	2.0217	10 56 14.8	8.247
20	12 17 55.27	2.0493	3 35 47.7	10.285	20	13 55 15.57	2.0220	11 04 27.9	8.191
21	12 19 58.18	2.0477	3 46 03.9	10.256	21	13 57 16.90	2.0223	11 12 37.7	8.134
22	12 22 01.00	2.0462	3 56 18.4	10.226	22	13 59 18.25	2.0227	11 20 44.0	8.077
23	12 24 03.72	+ 2.0446	S. 4 06 31.0	– 10.194	23	14 01 19.62	+ 2.0231	S. 11 28 46.9	– 8.018
	MONDAY 22.					**WEDNESDAY 24.**			
0	12 26 06.35	+ 2.0432	S. 4 16 41.7	– 10.162	0	14 03 21.02	+ 2.0235	S. 11 36 46.2	– 7.960
1	12 28 08.90	2.0418	4 26 50.5	10.131	1	14 05 22.44	2.0239	11 44 42.1	7.902
2	12 30 11.37	2.0404	4 36 57.4	10.098	2	14 07 23.89	2.0243	11 52 34.4	7.842
3	12 32 13.75	2.0391	4 47 02.3	10.065	3	14 09 25.36	2.0248	12 00 23.2	7.782
4	12 34 16.06	2.0379	4 57 05.2	10.030	4	14 11 26.87	2.0253	12 08 08.3	7.722
5	12 36 18.30	2.0367	5 07 05.9	9.995	5	14 13 28.40	2.0258	12 15 49.9	7.662
6	12 38 20.47	2.0356	5 17 04.6	9.961	6	14 15 29.97	2.0264	12 23 27.8	7.601
7	12 40 22.57	2.0344	5 27 01.2	9.925	7	14 17 31.57	2.0269	12 31 02.0	7.538
8	12 42 24.60	2.0333	5 36 55.6	9.887	8	14 19 33.20	2.0275	12 38 32.4	7.477
9	12 44 26.57	2.0322	5 46 47.7	9.850	9	14 21 34.87	2.0281	12 45 59.2	7.415
10	12 46 28.47	2.0312	5 56 37.6	9.812	10	14 23 36.57	2.0287	12 53 22.2	7.352
11	12 48 30.32	2.0304	6 06 25.2	9.774	11	14 25 38.32	2.0294	13 00 41.4	7.287
12	12 50 32.12	2.0296	6 16 10.5	9.735	12	14 27 40.10	2.0301	13 07 56.7	7.223
13	12 52 33.87	2.0287	6 25 53.4	9.695	13	14 29 41.93	2.0307	13 15 08.2	7.160
14	12 54 35.56	2.0278	6 35 33.9	9.655	14	14 31 43.79	2.0314	13 22 15.9	7.096
15	12 56 37.21	2.0272	6 45 12.0	9.614	15	14 33 45.70	2.0322	13 29 19.7	7.031
16	12 58 38.82	2.0264	6 54 47.6	9.572	16	14 35 47.65	2.0329	13 36 19.6	6.965
17	13 00 40.38	2.0257	7 04 20.7	9.531	17	14 37 49.65	2.0337	13 43 15.5	6.898
18	13 02 41.90	2.0251	7 13 51.3	9.488	18	14 39 51.69	2.0343	13 50 07.4	6.832
19	13 04 43.39	2.0246	7 23 19.3	9.445	19	14 41 53.77	2.0352	13 56 55.3	6.765
20	13 06 44.85	2.0240	7 32 44.7	9.402	20	14 43 55.91	2.0360	14 03 39.2	6.697
21	13 08 46.27	2.0235	7 42 07.5	9.357	21	14 45 58.09	2.0368	14 10 19.0	6.630
22	13 10 47.67	2.0231	7 51 27.6	9.312	22	14 48 00.32	2.0376	14 16 54.8	6.562
23	13 12 49.04	2.0226	8 00 45.0	9.267	23	14 50 02.60	2.0383	14 23 26.4	6.493
24	13 14 50.38	+ 2.0222	S. 8 09 59.6	– 9.221	24	14 52 04.92	+ 2.0392	S. 14 29 53.9	– 6.424

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 25.			
	h m s	s	° ′ ″	′
0	14 52 04.92	+ 2.0392	S.14 29 53.9	− 6.424
1	14 54 07.30	2.0401	14 36 17.3	6.355
2	14 56 09.73	2.0409	14 42 36.5	6.284
3	14 58 12.21	2.0417	14 48 51.4	6.214
4	15 00 14.74	2.0426	·14 55 02.2	6.144
5	15 02 17.32	2.0435	15 01 08.7	6.072
6	15 04 19.96	2.0444	15 07 10.9	6.002
7	15 06 22.65	2.0452	15 13 08.9	5.930
8	15 08 25.39	2.0462	15 19 02.5	5.857
9	15 10 28.19	2.0471	15 24 51.7	5.784
10	15 12 31.04	2.0479	15 30 36.6	5.712
11	15 14 33.94	2.0488	15 36 17.1	5.638
12	15 16 36.90	2.0497	15 41 53.2	5.565
13	15 18 39.91	2.0507	15 47 24.9	5.491
14	15 20 42.98	· 2.0516	15 52 52.1	5.416
15	15 22 46.10	2.0525	15 58 14.8	5.342
16	15 24 49.28	2.0534	16 03 33.1	5.267
17	15 26 52.51	2.0543	16 08 46.8	5.191
18	15 28 55.80	2.0552	16 13 56.0	5.115
19	15 30 59.14	2.0561	16 19 00.6	5.038
20	15 33 02.53	2.0570	16 24 00.6	4.962
21	15 35 05.98	2.0579	16 28 56.1	4.886
22	15 37 09.48	2.0587	16 33 46.9	4.808
23	15 39 13.03	+ 2.0597	S.16 38 33.1	− 4.731
	FRIDAY 26.			
0	15 41 16.64	+ 2.0606	S.16 43 14.6	− 4.652
1	15 43 20.30	2.0614	16 47 51.4	4.575
2	15 45 24.01	2.0623	16 52 23.6	4.497
3	15 47 27.78	2.0632	16 56 51.0	4.417
4	15 49 31.59	2.0640	17 01 13.7	4.338
5	15 51 35.46	2.0649	17 05 31.6	4.259
6	15 53 39.38	2.0657	17 09 44.8	4.179
7	15 55 43.35	2.0666	17 13 53.1	4.099
8	15 57 47.37	2.0673	17 17 56.7	4.020
9	15 59 51.43	2.0681	17 21 55.5	3.939
10	16 01 55.54	2.0689	17 25 49.4	3.857
11	16 03 59.70	2.0697	17 29 38.4	3.777
12	16 06 03.91	2.0705	17 33 22.6	3.696
13	16 08 08.16	2.0712	17 37 01.9	3.614
14	16 10 12.46	2.0720	17 40 36.3	3.532
15	16 12 16.80	2.0727	17 44 05.8	3.450
16	16 14 21.19	2.0735	17 47 30.3	3.367
17	16 16 25.62	2.0742	17 50 49.9	3.285
18	16 18 30.09	2.0747	17 54 04.5	3.202
19	16 20 34.59	2.0754	17 57 14.2	3.120
20	16 22 39.14	2.0762	18 00 18.9	3.036
21	16 24 43.73	2.0767	18 03 18.5	2.952
22	16 26 48.35	2.0773	18 06 13.2	2.869
23	16 28 53.01	2.0779	18 09 02.8	2.785
24	16 30 57.70	+ 2.0785	S.18 11 47.4	− 2.702

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 27.			
	h m s	s	° ′ ″	″
0	16 30 57.70	+ 2.0785	S.18 11 47.4	− 2.702
1	16 33 02.43	2.0791	18 14 27.0	2.617
2	16 35 07.19	2.0796	18 17 01.5	2.532
3	16 37 11.98	2.0802	18 19 30.9	2.448
4	16 39 16.81	2.0807	18 21 55.3	2.364
5	16 41 21.66	2.0811	18 24 14.6	2.279
6	16 43 26.54	2.0816	18 26 28.8	2.194
7	16 45 31.45	2.0820	18 28 37.9	2.108
8	16 47 36.38	2.0824	18 30 41.8	2.022
9	16 49 41.34	2.0828	18 32 40.6	1.937
10	16 51 46.32	2.0832	18 34 34.3	1.852
11	16 53 51.32	2.0835	18 36 22.8	1.766
12	16 55 56.34	2.0838	18 38 06.2	1.680
13	16 58 01.38	2.0841	18 39 44.4	1.594
14	17 00 06.43	2.0843	18 41 17.5	1.508
15	17 02 11.50	2.0847	18 42 45.4	1.422
16	17 04 16.59	2.0849	18 44 08.2	1.336
17	17 06 21.69	2.0851	18 45 25.7	1.249
18	17 08 26.80	2.0852	18 46 38.1	1.163
19	17 10 31.92	2.0853	18 47 45.3	1.077
20	17 12 37.04	2.0855	18 48 47.3	0.990
21	17 14 42.18	2.0857	18 49 44.1	0.903
22	17 16 47.32	2.0857	18 50 35.7	0.817
23	17 18 52.46	+ 2.0857	S.18 51 22.1	− 0.730
	SUNDAY 28.			
0	17 20 57.60	+ 2.0857	S.18 52 03.3	− 0.643
1	17 23 02.74	2.0857	18 52 39.3	0.557
2	17 25 07.89	2.0857	18 53 10.1	0.470
3	17 27 13.03	2.0856	18 53 35.7	0.382
4	17 29 18.16	2.0855	18 53 56.0	0.296
5	17 31 23.29	2.0854	18 54 11.2	0.210
6	17 33 28.41	2.0853	18 54 21.2	0.122
7	17 35 33.53	2.0852	18 54 25.9	− 0.035
8	17 37 38.63	2.0849	18 54 25.4	+ 0.051
9	17 39 43.72	2.0847	18 54 19.8	0.137
10	17 41 48.79	2.0844	18 54 08.9	0.224
11	17 43 53.85	2.0842	18 53 52.9	0.311
12	17 45 58.89	2.0839	18 53 31.6	0.398
13	17 48 03.92	2.0836	18 53 05.1	0.484
14	17 50 08.92	2.0832	18 52 33.5	0.571
15	17 52 13.90	2.0828	18 51 56.6	0.657
16	17 54 18.86	2.0824	18 51 14.6	0.743
17	17 56 23.79	2.0820	18 50 27.4	0.830
18	17 58 28.70	2.0815	18 49 35.0	0.916
19	18 00 33.57	2.0810	18 48 37.5	1.002
20	18 02 38.42	2.0805	18 47 34.8	1.088
21	18 04 43.23	2.0799	18 46 26.9	1.174
22	18 06 48.01	2.0793	18 45 13.9	1.259
23	18 08 52.75	2.0787	18 43 55.8	1.345
24	18 10 57.46	+ 2.0782	S.18 42 32.5	+ 1.431

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	MONDAY 29.					**WEDNESDAY 31.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 10 57.46	+ 2.0782	S.18 42 32.5	+ 1.431	0	19 49 34.85	+ 2.0248	S.15 59 34.9	+ 5.247
1	18 13 02.13	2.0775	18 41 04.1	1.516	1	19 51 36.30	2.0234	15 54 17.9	5.319
2	18 15 06.76	2.0768	18 39 30.6	1.601	2	19 53 37.66	2.0220	15 48 56.6	5.391
3	18 17 11.35	2.0761	18 37 52.0	1.686	3	19 55 38.94	2.0206	15 43 31.0	5.461
4	18 19 15.89	2.0753	18 36 08.3	1.771	4	19 57 40.13	2.0192	15 38 01.3	5.531
5	18 21 20.39	2.0747	18 34 19.5	1.856	5	19 59 41.24	2.0177	15 32 27.3	5.601
6	18 23 24.85	2.0739	18 32 25.6	1.940	6	20 01 42.26	2.0162	15 26 49.2	5.670
7	18 25 29.26	2.0731	18 30 26.7	2.024	7	20 03 43.19	2.0148	15 21 06.9	5.738
8	18 27 33.62	2.0722	18 28 22.7	2.108	8	20 05 44.04	2.0135	15 15 20.6	5.807
9	18 29 37.93	2.0714	18 26 13.7	2.192	9	20 07 44.81	2.0121	15 09 30.1	5.875
10	18 31 42.19	2.0706	18 23 59.7	2.276	10	20 09 45.49	2.0106	15 03 35.6	5.942
11	18 33 46.40	2.0697	18 21 40.6	2.359	11	20 11 46.08	2.0092	14 57 37.0	6.010
12	18 35 50.55	2.0687	18 19 16.6	2.442	12	20 13 46.59	2.0078	14 51 34.4	6.077
13	18 37 54.65	2.0678	18 16 47.5	2.526	13	20 15 47.02	2.0064	14 45 27.8	6.142
14	18 39 58.69	2.0669	18 14 13.5	2.608	14	20 17 47.36	2.0050	14 39 17.3	6.207
15	18 42 02.68	2.0659	18 11 34.5	2.692	15	20 19 47.62	2.0036	14 33 02.9	6.272
16	18 44 06.60	2.0649	18 08 50.5	2.774	16	20 21 47.79	2.0022	14 26 44.6	6.337
17	18 46 10.47	2.0639	18 06 01.6	2.856	17	20 23 47.88	2.0008	14 20 22.4	6.402
18	18 48 14.27	2.0628	18 03 07.8	2.937	18	20 25 47.89	1.9995	14 13 56.3	6.467
19	18 50 18.01	2.0618	18 00 09.1	3.019	19	20 27 47.82	1.9982	14 07 26.4	6.530
20	18 52 21.69	2.0607	17 57 05.5	3.101	20	20 29 47.67	1.9967	14 00 52.7	6.592
21	18 54 25.30	2.0597	17 53 57.0	3.182	21	20 31 47.43	1.9953	13 54 15.3	6.655
22	18 56 28.85	2.0586	17 50 43.7	3.262	22	20 33 47.11	1.9941	13 47 34.1	6.717
23	18 58 32.33	+ 2.0574	S.17 47 25.5	+ 3.342	23	20 35 46.72	+ 1.9927	S.13 40 49.3	+ 6.778
	TUESDAY 30.					**THURSDAY, JANUARY 1, 1903.**			
0	19 00 35.74	+ 2.0562	S.17 44 02.6	+ 3.422	0	20 37 46.24	+ 1.9913	S.13 34 00.7	+ 6.840
1	19 02 39.08	2.0551	17 40 34.8	3.503					
2	19 04 42.35	2.0539	17 37 02.2	3.582					
3	19 06 45.55	2.0527	17 33 24.9	3.662					
4	19 08 48.67	2.0514	17 29 42.8	3.742					
5	19 10 51.72	2.0502	17 25 55.9	3.820					
6	19 12 54.70	2.0490	17 22 04.4	3.897		**PHASES OF THE MOON.**			
7	19 14 57.60	2.0478	17 18 08.2	3.976					
8	19 17 00.43	2.0466	17 14 07.3	4.054				d h m	
9	19 19 03.19	2.0452	17 10 01.7	4.132	☽ First Quarter . . . Dec.			7 18 26.5	
10	19 21 05.86	2.0439	17 05 51.5	4.208	○ Full Moon			14 15 47.4	
11	19 23 08.46	2.0427	17 01 36.7	4.284	☾ Last Quarter			21 08 00.2	
12	19 25 10.98	2.0413	16 57 17.4	4.361	● New Moon			29 09 24.8	
13	19 27 13.42	2.0400	16 52 53.4	4.437					
14	19 29 15.78	2.0387	16 48 24.9	4.512					
15	19 31 18.06	2.0372	16 43 51.9	4.587				d h	
16	19 33 20.25	2.0359	16 39 14.4	4.662	☾ Apogee . . . . . . Dec.			2 04.3	
17	19 35 22.37	2.0346	16 34 32.4	4.737	☾ Perigee			15 01.6	
18	19 37 24.40	2.0332	16 29 46.0	4.811	☾ Apogee			29 06.7	
19	19 39 26.35	2.0318	16 24 55.1	4.885					
20	19 41 28.22	2.0304	16 19 59.8	4.958					
21	19 43 30.00	2.0290	16 15 00.1	5.032					
22	19 45 31.70	2.0277	16 09 56.0	5.104					
23	19 47 33.32	2.0262	16 04 47.6	5.176					
24	19 49 34.85	+ 2.0248	S.15 59 34.9	+ 5.247					

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object.		Noon.	P.L. of Diff.	III^h.	P.L. of Diff.	VI^h.	P.L. of Diff.	IX^h.	P.L. of Diff.
			o ′ ″		o ′ ″		o ′ ″		o ′ ″	
1	Sun	W.	16 01 33	3546	17 21 06	3539	18 40 47	3533	20 00 35	3527
	Fomalhaut	E.	71 56 08	3551	70 36 40	3563	69 17 25	3575	67 58 23	3587
	α Pegasi	E.	86 58 28	3250	85 33 18	3253	84 08 11	3256	82 43 08	3259
2	Sun	W.	26 41 00	3508	28 01 15	3506	29 21 32	3504	30 41 52	3503
	Fomalhaut	E.	61 27 02	3665	60 09 37	3684	58 52 34	3704	57 35 51	3726
	α Pegasi	E.	75 38 59	3279	74 14 23	3283	72 49 52	3287	71 25 25	3292
	α Arietis	E.	119 03 35	3184	117 37 07	3183	116 10 37	3181	114 44 05	3179
3	Sun	W.	37 23 57	3493	38 44 28	3491	40 05 02	3488	41 25 39	3486
	Fomalhaut	E.	51 18 27	3858	50 04 25	3891	48 50 56	3927	47 38 04	3967
	α Pegasi	E.	64 24 31	3314	63 00 36	3320	61 36 48	3325	60 13 06	3332
	α Arietis	E.	107 30 51	3169	106 04 05	3167	104 37 16	3164	103 10 24	3162
4	Sun	W.	48 09 34	3468	49 30 33	3464	50 51 37	3459	52 12 47	3454
	Fomalhaut	E.	41 44 49	4229	40 36 50	4300	39 29 57	4376	38 24 14	4462
	α Pegasi	E.	53 16 26	3367	51 53 32	3376	50 30 47	3386	49 08 14	3397
	α Arietis	E.	95 55 13	3146	94 27 59	3142	93 00 40	3138	91 33 16	3133
	Aldebaran	E.	129 17 55	3068	127 49 06	3065	126 20 13	3060	124 51 14	3056
5	Sun	W.	59 00 13	3423	60 22 04	3415	61 44 04	3407	63 06 13	3399
	Saturn	W.	17 08 40	3267	18 33 30	3236	19 58 57	3207	21 24 58	3179
	α Pegasi	E.	42 19 03	3472	40 58 08	3493	39 37 36	3516	38 17 30	3544
	α Arietis	E.	84 14 47	3106	82 46 45	3101	81 18 36	3094	79 50 19	3087
	Aldebaran	E.	117 24 50	3028	115 55 12	3021	114 25 25	3014	112 55 29	3006
6	Sun	W.	69 59 30	3350	71 22 43	3339	72 46 09	3328	74 09 48	3316
	α Aquilæ	W.	33 01 00	4702	34 01 58	4558	35 04 59	4427	36 09 56	4309
	Saturn	W.	28 42 22	3075	30 11 02	3059	31 40 02	3043	33 09 22	3026
	α Arietis	E.	72 26 45	3050	70 57 34	3041	69 28 12	3033	67 58 40	3024
	Aldebaran	E.	105 23 17	2962	103 52 17	2953	102 21 05	2942	100 49 39	2931
7	Sun	W.	81 11 42	3250	82 36 52	3236	84 02 18	3221	85 28 02	3206
	α Aquilæ	W.	41 59 02	3861	43 13 01	3793	44 28 10	3728	45 44 27	3667
	Saturn	W.	40 41 02	2948	42 12 20	2931	43 43 59	2915	45 15 59	2899
	Jupiter	W.	22 33 26	3067	24 02 16	3041	25 31 38	3016	27 01 31	2991
	α Arietis	E.	60 28 12	2978	58 57 32	2968	57 26 39	2958	55 55 34	2949
	Aldebaran	E.	93 08 53	2870	91 35 56	2858	90 02 43	2844	88 29 12	2829
8	Sun	W.	92 41 25	3124	94 09 06	3106	95 37 08	3088	97 05 32	3070
	Saturn	W.	53 01 11	2815	54 35 19	2798	56 09 49	2780	57 44 43	2 63
	α Aquilæ	W.	52 20 55	3415	53 42 54	3373	55 05 41	3332	56 29 16	3293
	Jupiter	W.	34 38 32	2876	36 11 21	2856	37 44 36	2835	39 18 19	2814
	α Arietis	E.	48 17 09	2902	46 44 53	2895	45 12 28	2887	43 39 53	2881
	Aldebaran	E.	80 36 52	2753	79 01 23	2738	77 25 34	2721	75 49 22	2704
9	Sun	W.	104 33 12	2976	106 03 55	2956	107 35 03	2936	109 06 36	2916
	Saturn	W.	65 45 11	2669	67 22 32	2652	69 00 17	2632	70 38 29	2611
	α Aquilæ	W.	63 38 06	3117	65 05 55	3086	66 34 22	3055	68 03 27	3025
	Jupiter	E.	47 13 34	2712	48 49 58	2692	50 26 49	2671	52 04 08	2650
	Aldebaran	E.	67 42 39	2616	66 04 06	2599	64 25 09	2580	62 45 46	2561
	Pollux	E.	110 25 02	2719	108 48 47	2698	107 12 05	2678	105 34 55	2657

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Sun	W.	21 20 29	3521	22 40 30	3516	24 00 37	3513	25 20 47	3510
	Fomalhaut	E.	66 39 35	3601	65 21 02	3616	64 02 45	3632	62 44 45	3648
	α Pegasi	E.	81 18 09	3264	79 53 15	3267	78 28 25	3271	77 03 40	3275
2	Sun	W.	32 02 13	3501	33 22 36	3500	34 43 00	3497	36 03 27	3495
	Fomalhaut	E.	56 19 31	3748	55 03 35	3772	53 48 04	3799	52 33 01	3827
	α Pegasi	E.	70 01 04	3296	68 36 48	3300	67 12 37	3305	65 48 31	3310
	α Arietis	E.	113 17 30	3178	111 50 54	3176	110 24 16	3173	108 57 35	3171
3	Sun	W.	42 46 19	3483	44 07 02	3480	45 27 48	3476	46 48 39	3472
	Fomalhaut	E.	46 25 52	4011	45 14 23	4058	44 03 40	4109	42 53 47	4166
	α Pegasi	E.	58 49 31	3338	57 26 03	3344	56 02 42	3351	54 39 30	3358
	α Arietis	E.	101 43 29	3159	100 16 31	3156	98 49 29	3153	97 22 23	3149
4	Sun	W.	53 34 03	3448	54 55 25	3443	56 16 53	3436	57 38 29	3429
	Fomalhaut	E.	37 19 48	4558	36 16 47	4668	35 15 20	4788	34 15 34	4926
	α Pegasi	E.	47 45 54	3408	46 23 47	3422	45 01 55	3437	43 40 20	3453
	α Arietis	E.	90 05 46	3129	88 38 11	3124	87 10 30	3118	85 42 42	3112
	Aldebaran	E.	123 22 10	3051	121 53 00	3046	120 23 44	3040	118 54 21	3034
5	Sun	W.	64 28 31	3390	65 50 59	3380	67 13 38	3370	68 36 28	3360
	Saturn	W.	22 51 32	3154	24 18 36	3133	25 46 06	3111	27 14 02	3091
	α Pegasi	E.	36 57 54	3576	35 38 54	3613	34 20 34	3654	33 02 58	3698
	α Arietis	E.	78 21 54	3080	76 53 20	3073	75 24 38	3065	73 55 46	3058
	Aldebaran	E.	111 25 23	2998	109 55 08	2989	108 24 42	2981	106 54 05	2972
6	Sun	W.	75 33 41	3304	76 57 48	3290	78 22 11	3277	79 46 49	3265
	α Aquilæ	W.	37 16 40	4203	38 25 03	4107	39 34 58	4019	40 46 19	3936
	Saturn	W.	34 39 03	3010	36 09 03	2994	37 39 23	2978	39 10 03	2963
	α Arietis	E.	66 28 57	3015	64 59 03	3006	63 28 58	2997	61 58 41	2987
	Aldebaran	E.	99 17 59	2920	97 46 05	2909	96 13 57	2896	94 41 33	2883
7	Sun	W.	86 54 04	3190	88 20 25	3174	89 47 05	3158	91 14 05	3141
	α Aquilæ	W.	47 01 49	3611	48 20 11	3558	49 39 31	3507	50 59 47	3461
	Saturn	W.	46 48 19	2883	48 21 00	2867	49 54 01	2849	51 27 25	2832
	Jupiter	W.	28 31 55	2965	30 02 51	2942	31 34 16	2920	33 06 10	2898
	α Arietis	E.	54 24 17	2939	52 52 47	2930	51 21 06	2920	49 49 13	2911
	Aldebaran	E.	86 55 22	2815	85 21 14	2801	83 46 47	2785	82 12 00	2769
8	Sun	W.	98 34 18	3052	100 03 26	3033	101 32 58	3014	103 02 53	2995
	Saturn	W.	59 20 00	2744	60 55 41	2726	62 31 46	2707	64 08 16	2689
	α Aquilæ	W.	57 53 36	3255	59 18 40	3219	60 44 27	3183	62 10 56	3149
	Jupiter	W.	40 52 29	2794	42 27 05	2774	44 02 07	2753	45 37 37	2732
	α Arietis	E.	42 07 10	2875	40 33 19	2871	39 01 23	2868	37 28 23	2866
	Aldebaran	E.	74 12 48	2687	72 35 51	2670	70 58 31	2652	69 20 47	2635
9	Sun	W.	110 38 35	2896	112 11 00	2876	113 43 49	2855	115 17 05	2835
	Saturn	W.	72 17 07	2593	73 56 12	2574	75 35 43	2554	77 15 41	2535
	α Aquilæ	W.	69 33 09	2996	71 03 27	2969	72 34 19	2940	74 05 47	2914
	Jupiter	E.	53 41 55	2630	55 20 09	2610	56 58 51	2589	58 38 01	2569
	Aldebaran	E.	61 05 57	2542	59 25 42	2523	57 45 01	2504	56 03 53	2485
	Pollux	E.	103 57 17	2637	102 19 12	2617	100 40 40	2595	99 01 40	2576

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	Sun	W.	116 50 48	2815	118 24 57	2795	119 59 32	2774	121 34 34	2754
	Saturn	W.	78 56 06	2515	80 36 59	2495	82 18 19	2475	84 00 07	2455
	α Aquilæ	W.	75 37 48	2888	77 10 22	2863	78 43 28	2839	80 17 05	2815
	Jupiter	W.	60 17 39	2548	61 57 45	2527	63 38 20	2507	65 19 23	2487
	Aldebaran	E.	54 22 19	2466	52 40 17	2447	50 57 49	2428	49 14 54	2408
	Pollux	E.	97 22 12	2556	95 42 16	2537	94 01 54	2517	92 21 04	2497
11	Saturn	W.	92 36 00	2359	94 20 33	2341	96 05 33	2323	97 51 00	2304
	α Aquilæ	W.	88 12 34	2709	89 49 02	2690	91 25 55	2672	93 03 12	2656
	Jupiter	W.	73 51 42	2388	75 35 34	2369	77 19 54	2350	79 04 41	2331
	Aldebaran	E.	40 33 27	2314	38 47 48	2296	37 01 43	2278	35 15 11	2261
	Pollux	E.	83 50 07	2403	82 06 36	2384	80 22 39	2367	78 38 17	2350
	Regulus	E.	120 21 02	2328	118 35 43	2309	116 49 56	2289	115 03 41	2270
12	Saturn	W.	106 44 44	2218	108 32 44	2203	110 21 07	2188	112 09 53	2173
	α Aquilæ	W.	101 14 47	2588	102 53 59	2577	104 33 25	2569	106 13 02	2563
	Jupiter	W.	87 55 15	2243	89 42 38	2227	91 30 26	2211	93 18 38	2196
	α Pegasi	W.	53 36 37	2455	55 18 54	2426	57 01 51	2400	58 45 26	2375
	Pollux	E.	69 50 32	2273	68 03 53	2260	66 16 54	2248	64 29 36	2236
	Regulus	E.	106 05 39	2182	104 16 44	2166	102 27 25	2150	100 37 42	2134
13	Jupiter	W.	102 25 02	2128	104 15 19	2117	106 05 52	2106	107 56 42	2096
	α Pegasi	W.	67 31 48	2269	69 18 33	2253	71 05 42	2237	72 53 15	2222
	α Arietis	W.	24 20 05	2540	26 00 23	2470	27 42 18	2410	29 25 39	2357
	Pollux	E.	55 29 17	2192	53 40 38	2187	51 51 51	2184	50 02 59	2182
	Regulus	E.	91 23 30	2066	89 31 39	2054	87 39 29	2044	85 47 03	2033
14	α Pegasi	W.	81 55 50	2168	83 45 06	2161	85 34 33	2154	87 24 10	2149
	α Arietis	W.	38 18 15	2186	40 07 03	2164	41 56 25	2145	43 46 15	2130
	Regulus	E.	76 21 09	1993	74 27 23	1987	72 33 28	1982	70 39 25	1978
15	α Pegasi	W.	96 33 29	2144	98 23 22	2146	100 13 11	2150	102 02 54	2155
	α Arietis	W.	53 00 32	2079	54 52 04	2073	56 43 45	2069	58 35 32	2066
	Aldebaran	W.	19 00 04	1972	20 54 23	1971	22 48 44	1970	24 43 06	1970
	Regulus	E.	61 08 05	1972	59 13 46	1973	57 19 29	1975	55 25 15	1978
	Spica	E.	114 42 45	1956	112 48 01	1956	110 53 17	1958	108 58 35	1960
16	α Arietis	W.	67 54 40	2074	69 46 19	2079	71 37 51	2084	73 29 15	2090
	Aldebaran	W.	34 14 19	1987	36 08 13	1993	38 01 58	2000	39 55 32	2008
	Regulus	E.	45 55 50	2009	44 02 29	2017	42 09 21	2027	40 16 29	2038
	Spica	E.	99 26 25	1982	97 32 23	1990	95 38 33	1997	93 44 54	2005
17	α Arietis	W.	82 43 12	2137	84 33 14	2149	86 22 58	2161	88 12 24	2175
	Aldebaran	W.	49 19 53	2059	51 11 56	2071	53 03 39	2083	54 55 04	2096
	Spica	E.	84 20 17	2058	82 28 13	2070	80 36 27	2083	78 45 01	2096
18	α Arietis	W.	97 14 15	2250	99 01 28	2267	100 48 16	2284	102 34 39	2301
	Aldebaran	W.	64 06 52	2169	65 56 06	2186	67 44 55	2201	69 33 21	2217
	Spica	E.	69 33 11	2170	67 43 58	2185	65 55 08	2202	64 06 43	2218
	Antares	E.	114 57 54	2219	113 09 55	2234	111 22 18	2249	109 35 03	2265
	Sun	E.	132 37 27	2504	130 56 19	2521	129 15 35	2538	127 35 14	2555

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Day of the Month	Name and Direction of Object		Midnight.	P.L. of Diff.	XVh.	P.L. of Diff.	XVIIIh.	P.L. of Diff.	XXIh.	P.L. of Diff.
10	Sun	W.	123 10 03	2734	124 45 58	2714	126 22 20	2694	127 59 08	2674
	Saturn	W.	85 42 23	2436	87 25 07	2417	89 08 17	2398	90 51 55	2379
	α Aquilæ	W.	81 51 13	2792	83 25 51	2771	85 00 57	2749	86 36 32	2729
	Jupiter	W.	67 00 55	2467	68 42 54	2447	70 25 22	2427	72 08 18	2408
	Aldebaran	E.	47 31 31	2389	45 47 41	2370	44 03 23	2351	42 18 38	2333
	Pollux	E.	90 39 46	2477	88 58 01	2459	87 15 50	2440	85 33 12	2421
11	Saturn	W.	99 36 53	2286	101 23 13	2269	103 09 58	2251	104 57 09	2235
	α Aquilæ	W.	94 40 51	2640	96 18 52	2626	97 57 12	2612	99 35 51	2599
	Jupiter	W.	80 49 55	2313	82 35 36	2295	84 21 43	2277	86 08 16	2260
	Aldebaran	E.	33 28 14	2243	31 40 51	2227	29 53 03	2210	28 04 51	2194
	Pollux	E.	76 53 31	2333	75 08 20	2317	73 22 46	2302	71 36 50	2287
	Regulus	E.	113 16 58	2252	111 29 48	2234	109 42 11	2216	107 54 08	2199
12	Saturn	W.	113 59 01	2159	115 48 31	2145	117 38 22	2132	119 28 32	2120
	α Aquilæ	W.	107 52 48	2557	109 32 42	2554	111 12 41	2552	112 52 42	2551
	Jupiter	W.	95 07 12	2181	96 56 08	2167	98 45 26	2153	100 35 04	2140
	α Pegasi	W.	60 29 37	2350	62 14 23	2328	63 59 41	2307	65 45 30	2287
	Pollux	E.	62 42 02	2225	60 54 11	2215	59 06 05	2206	57 17 46	2199
	Regulus	E.	98 47 35	2119	96 57 05	2105	95 06 14	2092	93 15 02	2079
13	Jupiter	W.	109 47 48	2086	111 39 08	2078	113 30 41	2070	115 22 26	2064
	α Pegasi	W.	74 41 10	2209	76 29 24	2197	78 17 57	2186	80 06 46	2176
	α Arietis	W.	31 10 15	2312	32 55 57	2272	34 42 37	2240	36 30 05	2212
	Pollux	E.	48 14 05	2182	46 25 11	2185	44 36 21	2189	42 47 37	2196
	Regulus	E.	83 54 20	2023	82 01 22	2014	80 08 10	2006	78 14 45	1999
14	α Pegasi	W.	89 13 55	2145	91 03 45	2143	92 53 38	2141	94 43 34	2142
	α Arietis	W.	45 36 29	2115	47 27 05	2103	49 17 59	2093	51 09 09	2085
	Regulus	E.	68 45 16	1975	66 51 02	1973	64 56 45	1971	63 02 25	1971
15	α Pegasi	W.	103 52 30	2161	105 41 56	2169	107 31 10	2178	109 20 11	2188
	α Arietis	W.	60 27 23	2066	62 19 15	2067	64 11 05	2068	66 02 54	2070
	Aldebaran	W.	26 37 28	1971	28 31 48	1973	30 26 05	1977	32 20 16	1982
	Regulus	E.	53 31 06	1982	51 37 04	1987	49 43 09	1993	47 49 24	2000
	Spica	E.	107 03 57	1963	105 09 24	1967	103 14 57	1971	101 20 37	1976
16	α Arietis	W.	75 20 29	2098	77 11 31	2107	79 02 19	2116	80 52 53	2126
	Aldebaran	W.	41 48 54	2017	43 42 02	2027	45 34 54	2037	47 27 31	2047
	Regulus	E.	38 23 54	2050	36 31 38	2063	34 39 42	2078	32 48 09	2094
	Spica	E.	91 51 28	2014	89 58 16	2025	88 05 20	2035	86 12 40	2046
17	α Arietis	W.	90 01 29	2189	91 50 13	2203	93 38 36	2218	95 26 37	2233
	Aldebaran	W.	56 46 09	2111	58 36 52	2124	60 27 14	2139	62 17 14	2153
	Spica	E.	76 53 55	2110	75 03 11	2124	73 12 49	2139	71 22 49	2154
18	α Arietis	W.	104 20 37	2320	106 06 08	2339	107 51 11	2358	109 35 47	2377
	Aldebaran	W.	71 21 23	2235	73 08 59	2251	74 56 10	2268	76 42 56	2285
	Spica	E.	62 18 42	2235	60 31 07	2253	58 43 58	2270	56 57 14	2287
	Antares	E.	107 48 12	2281	106 01 44	2296	104 15 39	2313	102 29 58	2329
	Sun	E.	125 55 17	2572	124 15 43	2589	122 36 33	2607	120 57 48	2625

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
19	a Arietis W.	111 19 55	2397	113 03 34	2417	114 46 44	2438	116 29 25	2459
	Aldebaran W.	78 29 17	2304	80 15 11	2321	82 00 40	2339	83 45 43	2356
	Pollux W.	36 56 42	2556	38 36 38	2554	40 16 36	2556	41 56 32	2559
	Spica E.	55 10 56	2305	53 25 04	2323	51 39 38	2341	49 54 38	2359
	Antares E.	100 44 41	2346	98 59 49	2364	97 15 23	2381	95 31 21	2398
	Sun E.	119 19 27	2644	117 41 32	2663	116 04 02	2681	114 26 57	2700
20	Aldebaran W.	92 24 32	2446	94 07 01	2465	95 49 04	2482	97 30 43	2499
	Pollux W.	50 14 16	2599	51 53 13	2610	53 31 56	2621	55 10 23	2633
	Spica E.	41 16 11	2450	39 33 48	2469	37 51 51	2487	36 10 19	2505
	Antares E.	86 57 32	2489	85 16 03	2507	83 34 59	2525	81 54 20	2543
	Sun E.	106 27 51	2795	104 53 17	2815	103 19 09	2834	101 45 25	2853
21	Aldebaran W.	105 52 52	2585	107 32 07	2602	109 10 58	2618	110 49 28	2635
	Pollux W.	63 18 25	2698	64 55 08	2711	66 31 33	2724	68 07 41	2738
	Regulus W.	26 19 00	2651	27 56 46	2661	29 34 19	2672	31 11 37	2683
	Spica E.	27 49 00	2596	26 10 00	2615	24 31 25	2632	22 53 14	2651
	Antares E.	73 37 16	2632	71 59 04	2649	70 21 16	2666	68 43 51	2684
	Sun E.	94 02 49	2946	92 31 28	2965	91 00 31	2982	89 29 55	2999
22	Pollux W.	76 03 45	2806	77 38 05	2820	79 12 07	2833	80 45 52	2846
	Regulus W.	39 14 13	2744	40 49 55	2756	42 25 21	2768	44 00 31	2780
	Antares E.	60 42 32	2769	59 07 23	2785	57 32 36	2801	55 58 10	2818
	Sun E.	82 02 18	3084	80 33 49	3100	79 05 39	3115	77 37 47	3131
23	Pollux W.	88 30 28	2909	90 02 35	2921	91 34 27	2933	93 06 04	2944
	Regulus W.	51 52 24	2839	53 26 01	2850	54 59 24	2861	56 32 33	2872
	Antares E.	48 11 18	2899	46 38 58	2916	45 06 59	2932	43 35 21	2950
	Sun E.	70 23 04	3203	68 56 59	3216	67 31 09	3229	66 05 35	3242
24	Pollux W.	100 40 36	2999	102 10 50	3010	103 40 50	3020	105 10 37	3030
	Regulus W.	64 14 59	2921	65 46 51	2930	67 18 32	2939	68 50 02	2947
	Spica W.	10 39 23	2968	12 10 16	2968	13 41 09	2968	15 12 02	2969
	Antares E.	36 02 36	3040	34 33 12	3060	33 04 13	3081	31 35 40	3104
	Sun E.	59 01 23	3301	57 37 13	3313	56 13 17	3324	54 49 33	3334
25	Pollux W.	112 36 29	3080	114 05 03	3089	115 33 26	3098	117 01 38	3108
	Regulus W.	76 25 00	2985	77 55 32	2992	79 25 55	2998	80 56 10	3004
	Spica W.	22 45 46	2987	24 16 15	2993	25 46 36	2998	27 16 51	3002
	Sun E.	47 53 44	3382	46 31 07	3391	45 08 40	3400	43 46 23	3408
26	Regulus W.	88 25 37	3032	89 55 10	3036	91 24 38	3041	92 54 00	3045
	Spica W.	34 46 44	3026	36 16 25	3030	37 46 00	3034	39 15 31	3038
	Sun E.	36 57 23	3450	35 36 02	3458	34 14 51	3467	32 53 50	3475
27	Regulus W.	100 19 36	3064	101 48 30	3067	103 17 20	3069	104 46 07	3072
	Mars • W.	65 34 46	3218	67 00 34	3221	68 26 18	3223	69 52 00	3225
	Spica W.	46 41 56	3055	48 11 01	3057	49 40 03	3060	51 09 02	3062
	Sun E.	26 11 15	3525	24 51 19	3537	23 31 37	3551	22 12 08	3567
31	Sun W.	18 08 26	3601	19 26 59	3583	20 45 52	3565	22 05 05	3549
	a Arietis E.	98 53 23	3143	97 26 06	3140	95 58 45	3137	94 31 20	3133

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVʰ.	P. L. of Diff.	XVIIIʰ.	P. L. of Diff.	XXIʰ.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
19	a Arietis	W.	118 11 36	2480	119 53 17	2502	121 34 27	2524	123 15 07	2546
	Aldebaran	W.	85 30 21	2375	87 14 32	2393	88 58 17	2410	90 41 37	2428
	Pollux	W.	43 36 23	2565	45 16 07	2572	46 55 41	2579	48 35 05	2588
	Spica	E.	48 10 04	2378	46 25 57	2396	44 42 16	2414	42 59 01	2431
	Antares	E.	93 47 44	2417	92 04 33	2435	90 21 48	2452	88 39 27	2470
	Sun	E.	112 50 17	2719	111 14 03	2738	109 38 14	2757	108 02 50	2776
20	Aldebaran	W.	99 11 57	2517	100 52 47	2535	102 33 12	2552	104 13 14	2569
	Pollux	W.	56 48 34	2645	58 26 28	2658	60 04 04	2671	61 41 23	2684
	Spica	E.	34 29 13	2523	32 48 32	2541	31 08 16	2559	29 28 25	2578
	Antares	E.	80 14 06	2561	78 34 17	2578	76 54 52	2596	75 15 52	2614
	Sun	E.	100 12 06	2872	98 39 11	2891	97 06 40	2909	95 34 33	2927
21	Aldebaran	W.	112 27 36	2651	114 05 22	2667	115 42 46	2682	117 19 50	2696
	Pollux	W.	69 43 30	2752	71 19 01	2766	72 54 13	2779	74 29 08	2793
	Regulus	W.	32 48 40	2695	34 25 27	2706	36 01 59	2719	37 38 14	2731
	Spica	E.	21 15 28	2671	19 38 09	2690	18 01 16	2710	16 24 50	2729
	Antares	E.	67 06 50	2701	65 30 12	2718	63 53 56	2735	62 18 03	2752
	Sun	E.	87 59 41	3017	86 29 49	3034	85 00 18	3051	83 31 08	3067
22	Pollux	W.	82 19 20	2859	83 52 32	2872	85 25 26	2884	86 58 05	2897
	Regulus	W.	45 35 25	2792	47 10 03	2804	48 44 25	2816	50 18 32	2828
	Antares	E.	54 24 05	2835	52 50 22	2851	51 17 00	2867	49 43 59	2883
	Sun	E.	76 10 15	3146	74 43 01	3161	73 16 05	3176	71 49 26	3189
23	Pollux	W.	94 37 27	2956	96 08 35	2967	97 39 29	2978	99 10 09	2989
	Regulus	W.	58 05 28	2882	59 38 10	2892	61 10 38	2902	62 42 55	2912
	Antares	E.	42 04 05	2966	40 33 10	2983	39 02 36	3001	37 32 24	3020
	Sun	E.	64 40 16	3255	63 15 12	3267	61 50 22	3279	60 25 46	3290
24	Pollux	W.	106 40 12	3040	108 09 35	3051	109 38 44	3060	111 07 42	3070
	Regulus	W.	70 21 21	2955	71 52 30	2963	73 23 29	2970	74 54 19	2977
	Spica	W.	16 42 53	2971	18 13 42	2973	19 44 28	2977	21 15 10	2981
	Antares	E.	30 07 35	3130	28 40 01	3157	27 13 00	3187	25 46 35	3221
	Sun	E.	53 26 00	3344	52 02 39	3354	50 39 30	3364	49 16 32	3373
25	Pollux	W.	118 29 38	3118	119 57 26	3127	121 25 03	3136	122 52 29	3145
	Regulus	W.	82 26 18	3010	83 56 18	3016	85 26 11	3022	86 55 57	3026
	Spica	W.	28 47 01	3007	30 17 05	3011	31 47 04	3016	33 16 57	3021
	Sun	E.	42 24 16	3417	41 02 19	3425	39 40 31	3433	38 18 52	3442
26	Regulus	W.	94 23 17	3049	95 52 29	3053	97 21 35	3056	98 50 38	3060
	Spica	W.	40 44 57	3042	42 14 18	3046	43 43 34	3049	45 12 47	3052
	Sun	E.	31 32 58	3484	30 12 16	3494	28 51 45	3504	27 31 24	3514
27	Regulus	W.	106 14 51	3075	107 43 31	3078	109 12 08	3080	110 40 43	3082
	Mars	W.	71 17 39	3227	72 43 16	3230	74 08 50	3231	75 34 22	3232
	Spica	W.	52 37 58	3065	54 06 50	3067	55 35 40	3068	57 04 29	3069
	Sun	E.	20 52 58	3587	19 34 10	3610	18 15 47	3633	16 57 48	3656
31	Sun	W.	23 24 36	3534	24 44 23	3520	26 04 25	3508	27 24 40	3497
	a Arietis	E.	93 03 51	3130	91 36 19	3127	90 08 42	3124	88 41 01	3120

GREENWICH MEAN TIME.

JANUARY.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	18 42 51.11	+17.715	− 24 50 01.9	+ 8.46	0 02.0
2	18 49 56.78	17.756	24 45 54.6	12.15	0 05.2
3	18 57 03.37	17.792	24 40 18.4	15.88	0 08.4
4	19 04 10.75	17.822	24 33 12.2	19.64	0 11.6
5	19 11 18.77	17.845	24 24 35.2	23.45	0 14.8
6	19 18 27.27	+17.862	− 24 14 26.6	+27.28	0 18.0
7	19 25 36.10	17.872	24 02 45.4	31.15	0 21.2
8	19 32 45.07	17.874	23 49 31.2	35.04	0 24.4
9	19 39 54.00	17.868	23 34 43.2	38.96	0 27.6
10	19 47 02.68	17.853	23 18 21.1	42.89	0 30.8
11	19 54 10.88	+17.828	− 23 00 24.4	+46.84	0 34.0
12	20 01 18.36	17.793	22 40 53.0	50.78	0 37.2
13	20 08 24.86	17.746	22 19 46.8	54.73	0 40.4
14	20 15 30.08	17.686	21 57 06.2	58.65	0 43.5
15	20 22 33.68	17.611	21 32 51.5	62.56	0 46.6
16	20 29 35.30	+17.521	− 21 07 03.5	+66.43	0 49.7
17	20 36 34.53	17.412	20 39 43.3	70.24	0 52.8
18	20 43 30.90	17.282	20 10 52.6	73.97	0 55.8
19	20 50 23.88	17.129	19 40 33.4	77.61	0 58.7
20	20 57 12.87	16.949	19 08 48.3	81.12	1 01.6
21	21 03 57.21	+16.740	− 18 35 40.6	+84.49	1 04.4
22	21 10 36.10	16.495	18 01 14.5	87.65	1 07.1
23	21 17 08.66	16.211	17 25 35.0	90.59	1 09.7
24	21 23 33.89	15.883	16 48 48.4	93.25	1 12.2
25	21 29 50.63	15.503	16 11 01.9	95.56	1 14.5
26	21 35 57.59	+15.066	− 15 32 24.5	+97.48	1 16.7
27	21 41 53.29	14.564	14 53 06.5	98.94	1 18.7
28	21 47 36.10	13.990	14 13 19.9	99.85	1 20.4
29	21 53 04.16	13.335	13 33 18.9	100.13	1 21 9
30	21 58 15.47	12.592	12 53 19.4	99.70	1 23.2
31	22 03 07.80	+11.753	− 12 13 39.4	+98.48	1 24.1
32	22 07 38.82	+10.813	− 11 34 39.1	+96.39	1 24.6

FEBRUARY.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	22 07 38.82	+10.813	− 11 34 39.1	+96.39	1 24.6
2	22 11 45.99	9.765	10 56 40.5	93.33	1 24.8
3	22 15 26.73	8.611	10 20 07.3	89.26	1 24.5
4	22 18 38.44	7.347	9 45 24.8	84.10	1 23.7
5	22 21 18.55	5.978	9 12 59.2	77.84	1 22.4
6	22 23 24.65	+ 4.515	− 8 43 17.1	+70.48	1 20.5
7	22 24 54.62	2.970	8 16 44.8	62.04	1 18.1
8	22 25 46.71	+ 1.364	7 53 47.4	52.59	1 15.0
9	22 25 59.72	− 0.284	7 34 47.6	42.25	1 11.2
10	22 25 33.13	1.931	7 20 05.0	31.19	1 06.8
11	22 24 27.27	− 3.546	− 7 09 54.6	+19.62	1 01.8
12	22 22 43.35	5.095	7 04 26.3	+ 7.74	0 56.1
13	22 20 23.62	6.526	7 03 43.1	− 4.12	0 49.8
14	22 17 31.35	7.799	7 07 40.9	15.62	0 43.0
15	22 14 10.85	8.873	7 16 07.9	26.48	0 35.8
16	22 10 27.29	− 9.715	− 7 28 44.4	−36.39	0 28.1
17	22 06 26.56	10.300	7 45 04.6	45.06	0 20.2
18	22 02 15.03	10.614	8 04 35.7	52.29	0 12.1
19	21 57 59.24	10.656	8 26 41.9	57.95	{ 0 02.9 / 23 55.~ }
20	21 53 45.61	10.437	8 50 44.3	61.98	23 47.8
21	21 49 40.16	− 9.979	− 9 16 04.1	−64.42	23 40.1
22	21 45 48.29	9.312	9 42 03.9	65.33	23 32.6
23	21 42 14.59	8.471	10 08 09.3	64.90	23 25.5
24	21 39 02.76	7.495	10 33 49.8	63.30	23 18.8
25	21 36 15.61	6.421	10 58 39.7	60.70	23 12.5
26	21 33 55.06	− 5.284	− 11 22 17.8	− 57.35	23 06.7
27	21 32 02.25	4.114	11 44 27.5	53.37	23 01.4
28	21 30 37.63	2.938	12 04 56.2	48.95	22 56.5
29	21 29 41.10	1.777	12 23 34.8	44.22	22 52.1
30	21 29 12.11	− 0.646	12 40 17.2	39.29	22 48.1
31	21 29 09.77	+ 0.443	− 12 54 59.7	− 34.24	22 44.5
32	21 29 32.98	+ 1.481	− 13 07 40.4	− 29.15	22 41.3

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter .	2.32	2.36	2.41	2.50	2.65	2.88	3.22
Hor. Parallax .	6.12	6.19	6.35	6.60	6.99	7.58	8.49

Day of the Month.	5th.	10th.	15th.	20th.	25th.
	″	″	″	″	″
Semidiameter . .	3.72	4.35	4.95	5.25	5.12
Hor. Parallax . .	9.79	11.46	13.05	13.82	13.50

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 29 41.10	− 1.777	− 12 23 34.8	−44.22	22 52.1
2	21 29 12.11	− 0.646	12 40 17.2	39.29	22 48.1
3	21 29 09.77	+ 0.443	12 54 59.7	34.24	22 44.5
4	21 29 32.98	1.481	13 07 40.4	29.15	22 41.3
5	21 30 20.44	2.464	13 18 18.8	24.06	22 38.5
6	21 31 30.78	+ 3.388	− 13 26 55.6	− 19.01	22 36.1
7	21 33 02.60	4.253	13 33 32.0	14.04	22 34.0
8	21 34 54.48	5.061	13 38 10.0	9.15	22 32.2
9	21 37 05.06	5.811	13 40 51.7	− 4.35	22 30.7
10	21 39 32.99	6.508	13 41 39.6	+ 0.35	22 29.5
11	21 42 17.01	+ 7.157	− 13 40 35.8	+ 4.94	22 28.5
12	21 45 15.92	7.749	13 37 43.2	9.42	22 27.8
13	21 48 28.61	8.301	13 33 04.2	13.81	22 27.3
14	21 51 54.05	8.812	13 26 41.3	18.09	22 26.9
15	21 55 31.27	9.284	13 18 36.7	22.27	22 26.8
16	21 59 19.40	+ 9.721	− 13 08 52.8	+26.37	22 26.8
17	22 03 17.62	10.126	12 57 31.5	30.39	22 27.0
18	22 07 25.20	10.501	12 44 35.0	34.31	22 27.3
19	22 11 41.47	10.851	12 30 05.3	38.15	22 27.7
20	22 16 05.83	11.176	12 14 04.3	41.92	22 28.3
21	22 20 37.73	+ 11.479	− 11 56 33.6	+45.62	22 29.0
22	22 25 16.65	11.762	11 37 35.0	49.24	22 29.8
23	22 30 02.16	12.028	11 17 10.2	52.81	22 30.7
24	22 34 53.89	12.280	10 55 20.6	56.31	22 31.8
25	22 39 51.47	12.517	10 32 07.7	59.75	22 32.9
26	22 44 54.59	+ 12.741	− 10 07 33.0	+63.13	22 34.1
27	22 50 02.97	12.952	9 41 37.8	66.45	22 35.4
28	22 55 16.39	13.161	9 14 23.6	69.72	22 36.7
29	23 00 34.63	13.359	8 45 51.6	72.94	22 38.1
30	23 05 57.55	13.550	8 16 03.1	76.10	22 39.6
31	23 11 25.00	+ 13.737	− 7 44 59.2	+79.21	22 41.2
32	23 16 56.88	+ 13.920	− 7 12 41.3	+82.27	22 42.9

APRIL.

Day of Month	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 16 56.88	+ 13.920	− 7 12 41.3	+ 82.27	22 42.9
2	23 22 33.11	14.099	6 39 10.5	85.29	22 44.6
3	23 28 13.64	14.278	6 04 28.0	88.25	22 46.4
4	23 33 58.44	14.456	5 28 35.0	91.16	22 48.3
5	23 39 47.52	14.635	4 51 32.8	94.02	22 50.2
6	23 45 40.91	+ 14.815	− 4 13 22.5	+ 96.82	22 52.2
7	23 51 38.64	14.997	3 34 05.4	99.59	22 54.3
8	23 57 40.78	15.182	2 53 42.8	102.29	22 56.5
9	0 03 47.42	15.372	2 12 16.1	104.92	22 58.8
10	0 09 58.68	15.567	1 29 46.9	107.50	23 01.1
11	0 16 14.68	+ 15.767	− 0 46 16.5	+110.02	23 03.5
12	0 22 35.57	15.975	− 0 01 46.7	112.45	23 06.0
13	0 29 01.52	16.190	+ 0 43 40.7	114.81	23 08.6
14	0 35 32.72	16.412	1 30 03.7	117.08	23 11.2
15	0 42 09.36	16.642	2 17 20.0	119.25	23 14.0
16	0 48 51.63	+ 16.882	+ 3 05 27.1	+121.32	23 16.9
17	0 55 39.75	17.130	3 54 22.3	123.25	23 19.8
18	1 02 33.93	17.387	4 44 02.2	125.02	23 22.9
19	1 09 34.38	17.652	5 34 23.1	126.67	23 26.1
20	1 16 41.30	17.925	6 25 21.1	128.12	23 29.4
21	1 23 54.85	+ 18.206	+ 7 16 51.3	+129.36	23 32.8
22	1 31 15.21	18.492	8 08 48.6	130.37	23 36.3
23	1 38 42.49	18.782	9 01 06.8	131.11	23 39.9
24	1 46 16.75	19.073	9 53 39.3	131.54	23 43.7
25	1 53 57.99	19.363	10 46 17.9	131.63	23 47.5
26	2 01 46.15	+ 19.649	+ 11 38 54.7	+131.36	23 51.5
27	2 09 41.07	19.926	12 31 20.1	130.68	23 55.6
28	2 17 42.48	20.189	13 23 23.9	129.56	23 59.8
29	2 25 50.00	20.435	14 14 55.0	127.95	
30	2 34 03.15	20.656	15 05 41.7	125.86	0 04.1
31	2 42 21.27	+ 20.849	+ 15 55 32.1	+123.25	0 08.5
32	2 50 43.61	+ 21.007	+ 16 44 13.5	+120.11	0 12.9

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter	4.76	4.34	3.96	3.64	3.37	3.15
Hor. Parallax	12.53	11.44	10.43	9.59	8.89	8.31

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″
Semidiameter	2.97	2.82	2.70	2.60	2.53	2.51
Hor. Parallax	7.82	7.43	7.11	6.85	6.68	6.61

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations are increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	2 42 21.27	+20.849	+15 55 32.1	+123.25	0 08.5
2	2 50 43.61	21.007	16 44 13.5	120.11	0 12.9
3	2 59 09.29	21.126	17 31 33.4	116.46	0 17.4
4	3 07 37.30	21.201	18 17 19.4	112.30	0 21.9
5	3 16 06.55	21.228	19 01 20.0	107.67	0 26.5
6	3 24 35.85	+21.205	+19 43 24.2	+102.61	0 31.1
7	3 33 03.98	21.130	20 23 22.1	97.16	0 35.6
8	3 41 29.68	21.003	21 01 05.3	91.39	0 40.1
9	3 49 51.70	20.824	21 36 26.9	85.37	0 44.5
10	3 58 08.82	20.595	22 09 21.4	79.15	0 48.9
11	4 06 19.87	+20.318	+22 39 45.1	+72.81	0 53.1
12	4 14 23.72	19.995	23 07 35.7	66.40	0 57.3
13	4 22 19.32	19.631	23 32 52.5	60.00	1 01.3
14	4 30 05.71	19.229	23 55 36.0	53.64	1 05.1
15	4 37 42.01	18.791	24 15 47.8	47.37	1 08.8
16	4 45 07.40	+18.320	+24 33 30.7	+41.24	1 12.2
17	4 52 21.15	17.820	24 48 48.3	35.26	1 15.5
18	4 59 22.57	17.294	25 01 44.8	29.47	1 18.6
19	5 06 11.06	16.743	25 12 24.8	23.90	1 21.5
20	5 12 46.05	16.170	25 20 53.5	18.54	1 24.1
21	5 19 07.03	+15.575	+25 27 16.4	+13.41	1 26.5
22	5 25 13.50	14.961	25 31 39.1	8.52	1 28.6
23	5 31 05.01	14.328	25 34 07.3	+3.87	1 30.5
24	5 36 41.12	13.678	25 34 47.0	−0.53	1 32.2
25	5 42 01.40	13.010	25 33 43.8	4.69	1 33.6
26	5 47 05.46	+12.325	+25 31 03.6	−8.61	1 34.7
27	5 51 52.89	11.624	25 26 52.2	12.30	1 35.5
28	5 56 23.29	10.906	25 21 15.2	15.74	1 36.0
29	6 00 36.28	10.173	25 14 18.3	18.96	1 36.3
30	6 04 31.48	9.424	25 06 07.1	21.94	1 36.3
31	6 08 08.52	+8.660	+24 56 46.9	−24.70	1 35.9
32	6 11 27.03	+7.881	+24 46 23.2	−27.24	1 35.3

JUNE.

Day of Month	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	6 11 27.03	+7.881	+24 46 23.2	−27.24	1 35.3
2	6 14 26.68	7.087	24 35 01.2	29.55	1 34.3
3	6 17 07.12	6.281	24 22 46.2	31.66	1 33.0
4	6 19 28.06	5.462	24 09 43.3	33.55	1 31.4
5	6 21 29.22	4.633	23 55 57.5	35.23	1 29.5
6	6 23 10.38	+3.796	+23 41 33.9	−36.70	1 27.2
7	6 24 31.38	2.954	23 26 37.5	37.96	1 24.6
8	6 25 32.15	2.110	23 11 13.5	39.01	1 21.6
9	6 26 12.70	1.269	22 55 26.7	39.85	1 18.3
10	6 26 33.14	+0.436	22 39 22.4	40.47	1 14.7
11	6 26 33.75	−0.382	+22 23 05.7	−40.88	1 10.8
12	6 26 14.93	1.181	22 06 41.9	41.06	1 06.5
13	6 25 37.28	1.952	21 50 16.5	41.02	1 02.0
14	6 24 41.55	2.685	21 33 55.0	40.73	0 57.1
15	6 23 28.76	3.372	21 17 43.2	40.21	0 52.0
16	6 22 00.12	−4.005	+21 01 47.1	−39.42	0 46.6
17	6 20 17.04	4.574	20 46 12.9	38.38	0 40.9
18	6 18 21.17	5.069	20 31 06.9	37.07	0 35.0
19	6 16 14.37	5.484	20 16 35.7	35.48	0 29.0
20	6 13 58.67	5.809	20 02 45.9	33.62	0 22.8
21	6 11 36.30	−6.038	+19 49 44.2	−31.48	0 16.5
22	6 09 09.60	6.169	19 37 37.0	29.07	0 10.2
23	6 06 41.00	6.198	19 26 30.8	26.40	{ 0 03.8 / 23 57.4 }
24	6 04 12.96	6.122	19 16 31.6	23.49	23 51.1
25	6 01 47.97	5.944	19 07 44.8	20.37	23 44.8
26	5 59 28.44	−5.667	+19 00 15.5	−17.05	23 38.7
27	5 57 16.70	5.296	18 54 07.6	13.58	23 32.7
28	5 55 14.93	4.837	18 49 24.6	9.99	23 27.0
29	5 53 25.17	4.297	18 46 08.8	6.32	23 21.5
30	5 51 49.28	3.683	18 44 21.6	−2.62	23 16.2
31	5 50 28.90	−3.005	+18 44 03.1	+1.07	23 11.2
32	5 49 25.46	−2.273	+18 45 12.6	+4.71	23 06.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter .	2.54	2.65	2.83	3.09	3.43	3.84	4.31
Hor. Parallax .	6.70	6.97	7.45	8.15	9.04	10.12	11.36

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . .	4.82	5.33	5.76	6.00	5.94	5.61
Hor. Parallax . .	12.71	14.05	15.18	15.79	15.69	14.78

Note.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

JULY. .

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	5 50 28.90	− 3.005	+18 44 03.1	+ 1.07	23 11.2
2	5 49 25.46	2.273	18 45 12.6	4.71	23 06.5
3	5 48 40.20	1.492	18 47 48.3	8.25	23 02.1
4	5 48 14.16	− 0.672	18 51 47.6	11.66	22 58.1
5	5 48 08.18	+ 0.179	18 57 06.6	14.89	22 54.4
6	5 48 22.96	+ 1.056	+19 03 40.9	+17.93	22 51.1
7	5 48 59.02	1.951	19 11 25.2	20.72	22 48.1
8	5 49 56.77	2.861	19 20 13.4	23.25	22 45.5
9	5 51 16.53	3.785	19 29 59.0	25.49	22 43.2
10	5 52 58.50	4.713	19 40 34.6	27.42	22 41.3
11	5 55 02.78	+ 5.645	+19 51 52.4	+29.01	22 39.8
12	5 57 29.46	6.579	20 03 44.2	30.25	22 38.6
13	6 00 18.54	7.511	20 16 01.2	31.11	22 37.9
14	6 03 29.98	8.442	20 28 34.2	31.58	22 37.5
15	6 07 03.71	9.368	20 41 13.7	31.64	22 37.4
16	6 10 59.60	+10.288	+20 53 49.4	+31.27	22 37.8
17	6 15 17.49	11.201	21 06 11.1	30.46	22 38.5
18	6 19 57.18	12.104	21 18 07.8	29.19	22 39.5
19	6 24 58.40	12.995	21 29 28.4	27.45	22 40.9
20	6 30 20.82	13.871	21 40 01.5	25.22	22 42.7
21	6 36 04.04	+14.727	+21 49 35.2	+22.50	22 44.8
22	6 42 07.52	15.559	21 57 57.6	19.28	22 47.2
23	6 48 30.66	16.364	22 04 56.7	15.56	22 50.0
24	6 55 12.71	17.134	22 10 20.7	11.36	22 53.0
25	7 02 12.77	17.864	22 13 58.0	6.67	22 56.4
26	7 09 29.79	+18.546	+22 15 37.3	+ 1.54	23 00.0
27	7 17 02.54	19.173	22 15 08.4	− 4.01	23 03.8
28	7 24 49.64	19.741	22 12 22.1	9.91	23 07.9
29	7 32 49.55	20.240	22 07 10.3	16.12	23 12.1
30	7 41 00.59	20.668	21 59 26.5	22.56	23 16.5
31	7 49 20.98	+21.018	+21 49 06.1	− 29.16	23 21.1
32	7 57 48.84	+21.290	+21 36 06.3	− 35.83	23 25.7

AUGUST.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	7 57 48.84	+ 21.290	+21 36 06.3	− 35.83	23 25.7
2	8 06 22.28	21.483	21 20 26.2	42.50	23 30.4
3	8 14 59.40	21.597	21 02 07.2	49.07	23 35.1
4	8 23 38.38	21.638	20 41 12.3	55.47	23 39.8
5	8 32 17.48	21.609	20 17 46.3	61.65	23 44.5
6	8 40 55.08	+21.515	+19 51 55.5	− 67.53	23 49.2
7	8 49 29.76	21.365	19 23 47.4	73.08	23 53.7
8	8 58 00.23	21.167	18 53 30.6	78.26	23 58.2
9	9 06 25.43	20.927	18 21 14.1	83.05	
10	9 14 44.44	20.654	17 47 07.4	87.44	0 02.6
11	9 22 56.54	+20.352	+17 11 20.1	− 91.43	0 06.9
12	9 31 01.16	20.031	16 34 01.7	95.03	0 11.1
13	9 38 57.90	19.696	15 55 21.5	98.25	0 15.1
14	9 46 46.49	19.352	15 15 28.6	101.10	0 18.9
15	9 54 26.76	19.003	14 34 31.5	103.60	0 22.7
16	10 01 58.63	+18.653	+13 52 38.2	−105.78	0 26.3
17	10 09 22.12	18.305	13 09 56.3	107.66	0 29.7
18	10 16 37.32	17.962	12 26 32.8	109.25	0 33.0
19	10 23 44.36	17.625	11 42 34.2	110.59	0 36.2
20	10 30 43.40	17.296	10 58 06.6	111.68	0 39.3
21	10 37 34.66	+16.977	+10 13 15.4	−112.55	0 42.2
22	10 44 18.36	16.667	9 28 05.7	113.22	0 45.0
23	10 50 54.74	16.367	8 42 42.2	113.71	0 47.6
24	10 57 24.04	16.077	7 57 09.2	114.02	0 50.2
25	11 03 46.52	15.798	7 11 30.7	114.16	0 52.6
26	11 10 02.42	+15.529	+ 6 25 50.4	−114.17	0 54.9
27	11 16 11.99	15.270	5 40 11.6	114.04	0 57.2
28	11 22 15.47	15.021	4 54 37.4	113.79	0 59.3
29	11 28 13.07	14.781	4 09 10.8	113.41	1 01.3
30	11 34 05.03	14.550	3 23 54.5	112.93	1 03.2
31	11 39 51.54	+14.327	+ 2 38 51.0	−112.34	1 05.0
32	11 45 32.79	+14.112	+ 1 54 02.8	−111.66	1 06.8

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . .	5.09	4.52	3.96	3.47	3.08	2.80
Hor. Parallax . .	13.42	11.89	10.43	9.16	8.13	7.36

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″
Semidiameter . .	2.60	2.50	2.46	2.46	2.50	2.56
Hor. Parallax . .	6.86	6.58	6.47	6.46	6.58	6.74

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

	SEPTEMBER						OCTOBER				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	11 45 32.79	+ 14.112	+ 1 54 02.8	− 111.66	1 06.8	1	13 55 37.72	+ 5.670	− 15 24 25.1	− 41.00	1 18.4
2	11 51 08.96	13.903	1 09 32.1	110.88	1 08.4	2	13 57 45.57	4.974	15 39 42.4	35.36	1 16.6
3	11 56 40.20	13.701	+ 0 25 21.2	110.01	1 10.0	3	13 59 35.94	4.212	15 52 38.5	29.23	1 14.5
4	12 02 06.65	13.504	− 0 18 27.9	109.06	1 11.5	4	14 01 07.23	3.383	16 03 01.3	22.58	1 12.0
5	12 07 28.43	13.312	1 01 53.1	108.02	1 12.9	5	14 02 17.75	2.481	16 10 37.9	15.36	1 09.3
6	12 12 45.65	+ 13.124	− 1 44 52.4	− 106.90	1 14.2	6	14 03 05.76	+ 1.507	− 16 15 13.9	− 7.53	1 06.1
7	12 17 58.39	12.938	2 27 23.9	105.70	1 15.5	7	14 03 29.54	+ 0.462	16 16 34.1	+ 0.96	1 02.5
8	12 23 06.71	12.755	3 09 25.6	104.42	1 16.7	8	14 03 27.43	− 0.649	16 14 22.8	10.10	0 58.6
9	12 28 10.66	12.574	3 50 55.6	103.06	1 17.8	9	14 02 57.92	1.820	16 08 24.0	19.91	0 54.1
10	12 33 10.26	12.393	4 31 52.0	101.62	1 18.9	10	14 01 59.74	3.034	15 58 22.1	30.35	0 49.2
11	12 38 05.50	+ 12.211	− 5 12 12.7	− 100.09	1 19.9	11	14 00 32.09	− 4.273	− 15 44 03.0	+ 41.32	0 43.8
12	12 42 56.35	12.027	5 51 55.8	98.48	1 20.8	12	13 58 34.67	5.509	15 25 15.7	52.68	0 37.9
13	12 47 42.75	11.840	6 30 59.2	96.78	1 21.6	13	13 56 07.96	6.708	15 01 53.1	64.21	0 31.5
14	12 52 24.61	11.649	7 09 20.7	94.99	1 22.3	14	13 53 13.34	7.827	14 33 54.9	75.59	0 24.7
15	12 57 01.81	11.451	7 46 58.0	93.10	1 23.0	15	13 49 53.26	8.821	14 01 29.2	86.42	0 17.5
16	13 01 34.18	+ 11.246	− 8 23 48.8	− 91.11	1 23.6	16	13 46 11.35	− 9.637	− 13 24 54.7	+ 96.24	0 09.8
17	13 06 01.54	11.032	8 59 50.4	89.01	1 24.1	17	13 42 12.47	10.227	12 44 42.3	104.49	{ 0 01.9 / 23 53.9
18	13 10 23.65	10.808	9 35 00.3	86.79	1 24.5	18	13 38 02.58	10.548	12 01 35.6	110.67	23 45.8
19	13 14 40.21	10.570	10 09 15.4	84.45	1 24.9	19	13 33 48.56	10.566	11 16 30.3	114.30	23 37.7
20	13 18 50.90	10.318	10 42 32.8	81.97	1 25.1	20	13 29 37.92	10.266	10 30 32.2	115.03	23 29.8
21	13 22 55.33	+ 10.048	− 11 14 49.0	− 79.35	1 25.2	21	13 25 38.33	− 9.647	− 9 44 53.3	+ 112.68	23 22.2
22	13 26 53.04	9.758	11 46 00.3	76.56	1 25.2	22	13 21 57.23	8.730	9 00 47.8	107.27	23 15.0
23	13 30 43.52	9.445	12 16 02.8	73.61	1 25.1	23	13 18 41.36	7.554	8 19 26.8	99.04	23 08.3
24	13 34 26.18	9.106	12 44 52.0	70.46	1 24.9	24	13 15 56.41	6.163	7 41 53.7	88.34	23 02.4
25	13 38 00.35	8.736	13 12 23.0	67.09	1 24.5	25	13 13 46.78	4.619	7 09 01.0	75.79	22 56.8
26	13 41 25.27	+ 8.334	− 13 38 30.6	− 63.50	1 24.0	26	13 12 15.48	− 2.979	− 6 41 26.3	+ 61.90	22 52.0
27	13 44 40.09	7.894	14 03 08.8	59.64	1 23.3	27	13 11 24.11	− 1.300	6 19 36.0	47.24	22 47.8
28	13 47 43.86	7.413	14 26 11.0	55.49	1 22.4	28	13 11 13.00	+ 0.368	6 03 40.7	32.37	22 44.3
29	13 50 35.53	6.885	14 47 30.0	51.03	1 21.3	29	13 11 41.39	1.985	5 53 40.3	17.74	22 41.5
30	13 53 13.91	6.305	15 06 57.7	46.21	1 20.0	30	13 12 47.65	3.519	5 49 24.6	+ 3.69	22 39.2
31	13 55 37.72	+ 5.670	− 15 24 25.1	− 41.00	1 18.4	31	13 14 29.50	+ 4.949	− 5 50 35.8	− 9.47	22 37.5
32	13 57 45.57	+ 4.974	− 15 39 42.4	− 35.36	1 16.6	32	13 16 44.27	+ 6.261	− 5 56 50.9	− 21.60	22 36.2

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	"	"	"	"	"	"			"	"	"	"	"
Semidiameter . . .	2.65	2.76	2.90	3.08	3.31	3.60	Semidiameter . . .	3.97	4.40	4.82	5.02	4.76	4.17
Hor. Parallax . . .	6.97	7.27	7.64	8.12	8.72	9.49	Hor. Parallax . . .	10.45	11.59	12.71	13.23	12.53	10.98

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

	NOVEMBER.						DECEMBER				
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	13 16 44.27	+ 6.261	− 5 56 50.9	−21.60	22 36.2	1	16 00 39.30	+16.232	−20 41 17.4	−63.36	23 25.5
2	13 19 29.04	7.449	6 07 43.5	32.58	22 35.5	2	16 07 09.87	16.315	21 06 08.3	60.87	23 28.1
3	13 22 40.82	8.512	6 22 45.5	42.38	22 35.1	3	16 13 42.43	16.398	21 29 58.4	58.30	23 30.8
4	13 26 16.67	9.456	6 41 28.5	51.00	22 35.1	4	16 20 16.99	16.481	21 52 46.0	55.66	23 33.4
5	13 30 13.81	10.288	7 03 24.6	58.48	22 35.4	5	16 26 53.52	16.563	22 14 29.5	52.95	23 36.1
6	13 34 29.65	+11.015	− 7 28 07.1	−64.88	22 36.0	6	16 33 32.03	+16.645	−22 35 07.3	−50.18	23 38.9
7	13 39 01.79	11.648	7 55 11.2	70.29	22 36.8	7	16 40 12.49	16.726	22 54 37.8	47.35	23 41.7
8	13 43 48.10	12.198	8 24 13.9	74.79	22 37.8	8	16 46 54.89	16.806	23 12 59.4	44.45	23 44.5
9	13 48 46.70	12.674	8 54 54.4	78.45	22 39.0	9	16 53 39.19	16.885	23 30 10.9	41.50	23 47.3
10	13 53 55.94	13.086	9 26 53.8	81.38	22 40.4	10	17 00 25.38	16.964	23 46 10.7	38.48	23 50.2
11	13 59 14.38	+13.442	− 9 59 55.4	−83.64	22 41.9	11	17 07 13.42	+17.040	−24 00 57.4	−35.40	23 53.1
12	14 04 40.80	13.751	10 33 44.1	85.33	22 43.5	12	17 14 03.27	17.114	24 14 29.5	32.26	23 56.0
13	14 10 14.13	14.020	11 08 07.1	86.50	22 45.2	13	17 20 54.88	17.186	24 26 45.7	29.07	23 58.9
14	14 15 53.50	14.255	11 42 52.3	87.20	22 47.0	14	17 27 48.19	17.256	24 37 44.6	25.82	
15	14 21 38.15	14.461	12 17 49.6	87.51	22 48.9	15	17 34 43.15	17.323	24 47 24.8	22.51	0 01.9
16	14 27 27.46	+14.644	−12 52 49.9	−87.46	22 50.8	16	17 41 39.67	+17.387	−24 55 44.8	−19.15	0 04.9
17	14 33 20.89	14.806	13 27 45.2	87.12	22 52.8	17	17 48 37.68	17.446	25 02 43.4	15.73	0 07.9
18	14 39 18.03	14.953	14 02 28.8	86.48	22 54.9	18	17 55 37.07	17.502	25 08 19.4	12.26	0 11.0
19	14 45 18.51	15.085	14 36 54.3	85.61	22 57.0	19	18 02 37.73	17.552	25 12 31.4	8.73	0 14.1
20	14 51 22.04	15.207	15 10 56.2	84.52	22 59.2	20	18 09 39.53	17.597	25 15 18.0	5.15	0 17.2
21	14 57 28.38	+15.320	−15 44 29.7	−83.24	23 01.4	21	18 16 42.35	+17.636	−25 16 38.3	− 1.51	0 20.3
22	15 03 37.35	15.426	16 17 30.5	81.80	23 03.6	22	18 23 46.02	17.669	25 16 30.9	+ 2.15	0 23.4
23	15 09 48.79	15.526	16 49 54.8	80.20	23 05.9	23	18 30 50.38	17.693	25 14 54.7	5.87	0 26.5
24	15 16 02.58	15.622	17 21 39.9	78.47	23 08.3	24	18 37 55.23	17.709	25 11 48.7	9.63	0 29.7
25	15 22 18.63	15.715	17 52 40.3	76.61	23 10.6	25	18 45 00.36	17.716	25 07 12.0	13.43	0 32.8
26	15 28 36.87	+15.805	−18 22 55.5	−74.64	23 13.0	26	18 52 05.54	+17.713	−25 01 03.6	+17.29	0 36.0
27	15 34 57.23	15.892	18 52 22.1	72.56	23 15.4	27	18 59 10.51	17.699	24 53 22.8	21.14	0 39.1
28	15 41 19.68	15.979	19 20 57.7	70.39	23 17.9	28	19 06 14.98	17.672	24 44 08.8	25.03	0 42.3
29	15 47 44.19	16.063	19 48 40.1	68.13	23 20.4	29	19 13 18.65	17.631	24 33 21.3	28.93	0 45.4
30	15 54 10.73	16.148	20 15 27.4	65.79	23 23.0	30	19 20 21.15	17.575	24 20 59.9	32.85	0 48.5
31	16 00 39.30	+16.232	− 20 41 17.4	−63.36	23 25.5	31	19 27 22.10	+17.501	−24 07 04.4	+36.77	0 51.6
32	16 07 09.87	+16.315	− 21 06 08.3	−60.87	23 28.1	32	19 34 21.06	+17.409	−23 51 35.2	+40.67	0 54.6

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″		″	″	″	″	″	″	″
Semidiameter .	3.58	3.14	2.83	2.63	2.49	2.40	Semidiameter .	2.34	2.31	2.30	2.32	2.36	2.43	2.54
Hor. Parallax .	9.43	8.26	7.46	6.92	6.56	6.31	Hor. Parallax .	6.16	6.08	6.07	6.11	6.22	6.40	6.69

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 45 10.17	+6.367	−13 46 33.2	+55.22	3 04.2
2	21 47 40.37	6.149	13 24 28.4	55.13	3 02.7
3	21 50 05.26	5.924	13 02 26.2	54.99	3 01.2
4	21 52 24.68	5.693	12 40 28.1	54.79	2 59.6
5	21 54 38.48	5.456	12 18 35.6	54.54	2 57.8
6	21 56 46.49	+5.211	−11 56 50.2	+54.22	2 56.0
7	21 58 48.54	4.959	11 35 13.6	53.82	2 54.1
8	22 00 44.45	4.700	11 13 47.2	53.35	2 52.1
9	22 02 34.05	4.432	10 52 32.8	52.81	2 49.9
10	22 04 17.13	4.157	10 31 32.3	52.20	2 47.7
11	22 05 53.49	+3.872	−10 10 47.4	+51.51	2 45.4
12	22 07 22.92	3.579	9 50 20.1	50.73	2 42.9
13	22 08 45.22	3.277	9 30 12.2	49.87	2 40.3
14	22 10 00.17	2.965	9 10 25.8	48.93	2 37.6
15	22 11 07.55	2.646	8 51 02.8	47.92	2 34.8
16	22 12 07.12	+2.317	−8 32 05.5	+46.82	2 31.9
17	22 12 58.68	1.978	8 13 36.0	45.62	2 28.8
18	22 13 41.99	1.630	7 55 36.6	44.32	2 25.6
19	22 14 16.85	1.274	7 38 09.7	42.91	2 22.2
20	22 14 43.09	0.911	7 21 17.5	41.40	2 18.7
21	22 15 00.51	+0.540	−7 05 02.3	+39.80	2 15.0
22	22 15 08.94	+0.162	6 49 26.7	38.10	2 11.2
23	22 15 08.24	−0.221	6 34 33.1	36.31	2 07.2
24	22 14 58.29	0.609	6 20 23.8	34.42	2 03.1
25	22 14 39.01	0.999	6 07 01.2	32.42	1 58.9
26	22 14 10.35	−1.390	−5 54 27.6	+30.31	1 54.5
27	22 13 32.29	1.782	5 42 45.5	28.11	1 49.9
28	22 12 44.85	2.171	5 31 57.2	25.83	1 45.2
29	22 11 48.10	2.557	5 22 04.9	23.46	1 40.3
30	22 10 42.16	2.937	5 13 10.6	21.01	1 35.2
31	22 09 27.21	−3.308	−5 05 16.2	+18.48	1 30.0
32	22 08 03.47	−3.669	−4 58 23.4	+15.89	1 24.7

FEBRUARY.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	22 08 03.47	−3.669	−4 58 23.4	+15.89	1 24.7
2	22 06 31.21	4.016	4 52 33.7	13.23	1 19.2
3	22 04 50.83	4.346	4 47 48.5	10.52	1 13.6
4	22 03 02.74	4.657	4 44 08.9	7.77	1 07.9
5	22 01 07.45	4.947	4 41 35.4	5.01	1 02.1
6	21 59 05.50	−5.211	−4 40 08.3	+ 2.25	0 56.2
7	21 56 57.54	5.447	4 39 47.5	− 0.51	0 50.2
8	21 54 44.27	5.653	4 40 32.7	3.23	0 44.0
9	21 52 26.44	5.827	4 42 22.7	5.91	0 37.7
10	21 50 04.83	5.965	4 45 16.2	8.51	0 31.4
11	21 47 40.33	−6.069	−4 49 11.2	−11.02	0 25.1
12	21 45 13.84	6.132	4 54 05.4	13.43	0 18.8
13	21 42 46.31	6.156	4 59 55.9	15.71	0 12.4
14	21 40 18.66	6.141	5 06 39.7	17.86	{ 0 06.0 / 23 59.7 }
15	21 37 51.85	6.086	5 14 13.1	19.84	23 53.4
16	21 35 26.86	−5.990	−5 22 32.1	−21.65	23 47.1
17	21 33 04.63	5.856	5 31 32.5	23.28	23 40.9
18	21 30 46.10	5.682	5 41 09.7	24.72	23 34.7
19	21 28 32.16	5.474	5 51 19.0	25.96	23 28.6
20	21 26 23.63	5.232	6 01 55.7	27.00	23 22.6
21	21 24 21.29	− 4.957	−6 12 54.9	−27.84	23 16.8
22	21 22 25.89	4.655	6 24 11.9	28.48	23 11.1
23	21 20 38.05	4.327	6 35 41.9	28.92	23 05.5
24	21 18 58.36	3.977	6 47 20.2	29.17	23 00.0
25	21 17 27.29	3.609	6 59 02.3	29.25	22 54.7
26	21 16 05.26	−3.225	−7 10 44.2	−29.16	22 49.6
27	21 14 52.60	2.828	7 22 22.0	28.91	22 44.6
28	21 13 49.58	2.422	7 33 51.9	28.51	22 39.8
29	21 12 56.37	2.011	7 45 10.5	27.97	22 35.2
30	21 12 13.08	1.596	7 56 14.5	27.30	22 30.7
31	21 11 39.78	−1.179	−8 07 01.1	−26.53	22 26.4
32	21 11 16.47	−0.764	−8 17 27.9	−25.65	22 22.2

Day of the Month.	0.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″	″
Semidiameter .	17.87	19.28	20.83	22.56	24.42	26.36	28.24
Hor. Parallax .	18.41	19.84	21.45	23.22	25.15	27.13	29.08

Day of the Month.	4th.	9th.	14th.	19th.	24th.
	″	″	″	″	″
Semidiameter .	29.84	30.93	31.27	30.81	29.61
Hor. Parallax .	30.73	31.84	32.20	31.72	30.49

Note.—The sign + indicates north declinations; the sign - indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 12 56.37	−2.011	−7 45 10.5	−27.97	22 35.2
2	21 12 13.08	1.596	7 56 14.5	27.30	22 30.7
3	21 11 39.78	1.179	8 07 01.1	26.53	22 26.4
4	21 11 16.47	0.764	8 17 27.9	25.65	22 22.2
5	21 11 03.11	−0.351	8 27 32.4	24.68	22 18.1
6	21 10 59.59	+0.057	−8 37 12.4	−23.62	22 14.2
7	21 11 05.79	0.459	8 46 26.0	22.49	22 10.5
8	21 11 21.54	0.853	8 55 11.6	21.30	22 07.0
9	21 11 46.64	1.238	9 03 27.9	20.05	22 03.7
10	21 12 20.89	1.614	9 11 13.4	18.74	22 00.5
11	21 13 04.04	+1.980	−9 18 27.1	−17.38	21 57.4
12	21 13 55.85	2.336	9 25 07.8	15.99	21 54.5
13	21 14 56.07	2.681	9 31 15.0	14.57	21 51.7
14	21 16 04.43	3.014	9 36 47.8	13.13	21 49.0
15	21 17 20.67	3.337	9 41 45.6	11.67	21 46.4
16	21 18 44.52	+3.649	−9 46 07.8	−10.18	21 43.9
17	21 20 15.73	3.950	9 49 54.1	8.67	21 41.5
18	21 21 54.04	4.240	9 53 03.9	7.15	21 39.3
19	21 23 39.18	4.519	9 55 37.0	5.62	21 37.3
20	21 25 30.88	4.788	9 57 33.0	4.07	21 35.4
21	21 27 28.91	+5.046	−9 58 51.9	− 2.51	21 33.6
22	21 29 33.01	5.294	9 59 33.5	− 0.95	21 31.8
23	21 31 42.95	5.532	9 59 37.8	+ 0.60	21 30.1
24	21 33 58.47	5.760	9 59 04.8	2.15	21 28.5
25	21 36 19.35	5.978	9 57 54.6	3.70	21 26.9
26	21 38 45.34	+6.186	−9 56 07.3	+ 5.24	21 25.4
27	21 41 16.22	6.385	9 53 43.0	6.77	21 24.0
28	21 43 51.76	6.575	9 50 42.0·	8.29	21 22.7
29	21 46 31.77	6.756	9 47 04.5	9.80	21 21.5
30	21 49 16.00	6.929	9 42 50.9	11.31	21 20.5
31	21 52 04.28	+7.094	−9 38 01.5	+12.80	21 19.5
32	21 54 56.42	+7.250	−9 32 36.5	+14.27	21 18.5

APRIL.

Day of Month	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 54 56.42	+7.250	−9 32 36.5	+14.27	21 18.5
2	21 57 52.22	7.398	9 26 36.3	15.72	21 17.5
3	22 00 51.48	7.539	9 20 01.5	17.15	21 16.6
4	22 03 54.05	7.673	9 12 52.4	18.57	21 15.7
5	22 06 59.75	7.800	9 05 09.6	19.97	21 14.9
6	22 10 08.41	+7.920	−8 56 53.6	+21.35	21 14.1
7	22 13 19.87	8.034	8 48 04.6	22.71	21 13.4
8	22 16 34.00	8.142	8 38 43.3	24.04	21 12.7
9	22 19 50.65	8.244	8 28 50.2	25.35	21 12.1
10	22 23 09.68	8.341	8 18 26.1	26.64	21 11.5
11	22 26 30.97	+8.432	−8 07 31.3	+27.90	21 11.0
12	22 29 54.40	8.520	7 56 06.3	29.14	21 10.5
13	22 33 19.88	8.603	7 44 11.6	30.36	21 10.0
14	22 36 47.29	8.681	7 31 47.9	31.57	21 09.5
15	22 40 16.53	8.756	7 18 55.7	32.76	21 09.1
16	22 43 47.52	+8.827	−7 05 35.5	+33.92	21 08.7
17	22 47 20.18	8.895	6 51 47.9	35.05	21 08.3
18	22 50 54.45	8.960	6 37 33.4	36.16	21 07.9
19	22 54 30.24	9.022	6 22 52.6	37.24	21 07.6
20	22 58 07.48	9.081	6 07 46.1	38.30	21 07.3
21	23 01 46.10	+9.137	−5 52 14.4	+39.33	21 07.0
22	23 05 26.05	9.191	5 36 18.3	40.33	21 06.7
23	23 09 07.28	9.243	5 19 58.3	41.31	21 06.5
24	23 12 49.72	9.293	5 03 15.1	42.27	21 06.3
25	23 16 33.32	9.340	4 46 09.3	43.20	21 06.1
26	23 20 18.04	+9.385	−4 28 41.6	+44.10	21 05.9
27	23 24 03.83	9.429	4 10 52.6	44.97	21 05.7
28	23 27 50.64	9.471	3 52 43.0	45.81	21 05.6
29	23 31 38.44	9.511	3 34 13.5	46.63	21 05.5
30	23 35 27.18	·9.550	3 15 24.8	47.42	21 05.4
31	23 39 16.84	+9.588	−2 56 17.5	+48.18	21 05.3
32	23 43 07.38	+9.625	−2 36 52.4	+48.91	21 05.2

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter	27.92	25.98	24.01	22.12	20.38	18.82	17.42
Hor. Parallax	28.76	26.75	24.71	22.78	21.00	19.38	17.93

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . . .	16.18	15.08	14.12	13.25	12.48	11.79
Hor. Parallax . . .	16.66	15.53	14.53	13.64	12.85	12.14

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

	MAY.						JUNE.				
Day of Month	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	23 39 16.84	+ 9.588	− 2 56 17.5	+48.18	21 05.3	1	1 44 11.42	+10.580	+ 8 26 12.4	+57.27	21 08.3
2	23 43 07.38	9.625	2 36 52.4	48.91	21 05.2	2	1 48 25.81	10.618	8 49 05.4	57.10	21 08.6
3	23 46 58.78	9.660	2 17 10.2	49.61	21 05.2	3	1 52 41.11	10.656	9 11 53.8	56.90	21 08.9
4	23 50 51.00	9.693	1 57 11.6	50.28	21 05.1	4	1 56 57.33	10.695	9 34 37.0	56.67	21 09.2
5	23 54 44.01	9.725	1 36 57.2	50.91	21 05.1	5	2 01 14.49	10.735	9 57 14.2	56.41	21 09.6
6	23 58 37.80	+ 9.756	− 1 16 27.9	+51.51	21 05.0	6	2 05 32.59	+10.775	+10 19 44.7	+56.12	21 10.0
7	0 02 32.33	9.787	0 55 44.3	52.08	21 05.0	7	2 09 51.65	10.815	10 42 07.7	55.80	21 10.4
8	0 06 27.59	9.817	0 34 47.2	52.63	21 04.9	8	2 14 11.69	10.856	11 04 22.6	55.44	21 10.8
9	0 10 23.57	9.847	−0 13 37.2	53.16	21 04.9	9	2 18 32.71	10.897	11 26 28.6	55.05	21 11.2
10	0 14 20.25	9.876	+0 07 44.9	53.66	21 04.9	10	2 22 54.73	10.940	11 48 25.1	54.63	21 11.6
11	0 18 17.62	+ 9.905	+0 29 18.5	+54.13	21 05.0	11	2 27 17.78	+10.983	+12 10 11.3	+54.19	21 12.1
12	0 22 15.68	9.933	0 51 03.0	54.57	21 05.0	12	2 31 41.87	11.027	12 31 46.6	53.72	21 12.6
13	0 26 14.43	9.962	1 12 57.6	54.98	21 05.1	13	2 36 07.01	11.071	12 53 10.2	53.22	21 13.1
14	0 30 13.88	9.991	1 35 01.6	55.36	21 05.1	14	2 40 33.22	11.115	13 14 21.4	52.70	21 13.6
15	0 34 14.01	10.020	1 57 14.4	55.70	21 05.2	15	2 45 00.51	11.160	13 35 19.6	52.15	21 14.1
16	0 38 14.84	+10.049	+2 19 35.3	+56.02	21 05.3	16	2 49 28.91	+11.206	+13 56 04.0	+51.57	21 14.6
17	0 42 16.38	10.078	2 42 03.6	56.32	21 05.4	17	2 53 58.44	11.253	14 16 33.9	50.95	21 15.2
18	0 46 18.63	10.108	3 04 38.7	56.59	21 05.5	18	2 58 29.11	11.301	14 36 48.6	50.30	21 15.8
19	0 50 21.60	10.139	3 27 19.8	56.83	21 05.6	19	3 03 00.92	11.350	14 56 47.5	49.61	21 16.4
20	0 54 25.30	10.170	3 50 06.4	57.04	21 05.7	20	3 07 33.89	11.399	15 16 29.7	48.89	21 17.0
21	0 58 29.75	+10.202	+4 12 57.7	+57.22	21 05.8	21	3 12 08.02	+11.448	+15 35 54.6	+48.14	21 17.7
22	1 02 34.96	10.234	4 35 53.0	57.37	21 06.0	22	3 16 43.34	11.497	15 55 01.6	47.37	21 18.4
23	1 06 40.93	10.266	4 58 51.6	57.49	21 06.2	23	3 21 19.85	11.546	16 13 49.8	46.59	21 19.1
24	1 10 47.68	10.299	5 21 52.9	57.59	21 06.4	24	3 25 57.55	11.596	16 32 18.6	45.78	21 19.8
25	1 14 55.23	10.332	5 44 56.0	57.66	21 06.6	25	3 30 36.46	11.646	16 50 27.2	44.94	21 20.5
26	1 19 03.59	+10.366	+6 08 00.4	+57.70	21 06.8	26	3 35 16.58	+11.696	+17 08 15.0	+44.07	21 21.2
27	1 23 12.77	10.400	6 31 05.3	57.71	21 07.0	27	3 39 57.90	11.747	17 25 41.4	43.16	21 22.0
28	1 27 22.78	10.435	6 54 10.0	57.69	21 07.2	28	3 44 40.42	11.797	17 42 45.5	42.21	21 22.8
29	1 31 33.63	10.470	7 17 13.8	57.63	21 07.5	29	3 49 24.15	11.847	17 59 26.8	41.23	21 23.6
30	1 35 45.35	10.506	7 40 15.9	57.54	21 07.7	30	3 54 09.08	11.897	18 15 44.5	40.23	21 24.4
31	1 39 57.94	+10.543	+8 03 15.7	+57.42	21 08.0	31	3 58 55.19	+11.946	+18 31 37.8	+39.20	21 25.2
32	1 44 11.42	+10.580	+8 26 12.4	+57.27	21 08.3	32	4 03 42.48	+11.995	+18 47 06.2	+38.15	21 26.1

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . .	11.18	10.63	10.13	9.68	9.27	8.90	Semidiameter . .	8.56	8.25	7.97	7.71	7.47	7.25
Hor. Parallax . .	11.51	10.94	10.43	9.96	9.54	9.16	Hor. Parallax . .	8.81	8.49	8.20	7.93	7.68	7.46

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 58 55.19	+11.946	+18 31 37.8	+39.20	21 25.2
2	4 03 42.48	11.995	18 47 06.2	38.15	21 26.1
3	4 08 30.94	12.043	19 02 09.1	37.07	21 27.0
4	4 13 20.55	12.091	19 16 45.7	35.96	21 27.9
5	4 18 11.29	12.138	19 30 55.4	34.82	21 28.8
6	4 23 03.15	+12.184	+19 44 37.6	+33.66	21 29.7
7	4 27 56.12	12.229	19 57 51.6	32.48	21 30.7
8	4 32 50.16	12.274	20 10 36.9	31.27	21 31.7
9	4 37 45.27	12.318	20 22 52.8	30.04	21 32.7
10	4 42 41.42	12.361	20 34 38.8	28.78	21 33.7
11	4 47 38.59	+12.403	+20 45 54.3	+27.50	21 34.7
12	4 52 36.76	12.444	20 56 38.7	26.20	21 35.7
13	4 57 35.89	12.484	21 06 51.6	24.87	21 36.8
14	5 02 35.97	12.522	21 16 32.3	23.52	21 37.9
15	5 07 36.97	12.559	21 25 40.5	22.15	21 39.0
16	5 12 38.86	+12.595	+21 34 15.5	+20.76	21 40.1
17	5 17 41.60	12.630	21 42 17.0	19.35	21 41.2
18	5 22 45.17	12.664	21 49 44.4	17.92	21 42.3
19	5 27 49.53	12.696	21 56 37.3	16.48	21 43.4
20	5 32 54.65	12.727	22 02 55.4	15.02	21 44.6
21	5 38 00.48	+12.756	+22 08 38.2	+13.54	21 45.8
22	5 43 06.99	12.784	22 13 45.3	12.05	21 47.0
23	5 48 14.14	12.810	22 18 16.4	10.54	21 48.2
24	5 53 21.89	12.834	22 22 11.2	9.02	21 49.4
25	5 58 30.18	12.856	22 25 29.3	7.48	21 50.6
26	6 03 38.98	+12.876	+22 28 10.5	+5.93	21 51.8
27	6 08 48.24	12.894	22 30 14.6	4.38	21 53.0
28	6 13 57.91	12.910	22 31 41.2	2.82	21 54.2
29	6 19 07.94	12.924	22 32 30.3	+1.26	21 55.4
30	6 24 18.28	12.935	22 32 41.6	−0.31	21 56.6
31	6 29 28.88	+12.944	+22 32 15.0	−1.89	21 57.8
32	6 34 39.69	+12.951	+22 31 10.3	−3.48	21 59.1

AUGUST.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	6 34 39.69	+12.951	+22 31 10.3	−3.48	21 59.1
2	6 39 50.64	12.957	22 29 27.6	5.07	22 00.4
3	6 45 01.69	12.961	22 27 06.7	6.66	22 01.6
4	6 50 12.78	12.963	22 24 07.6	8.25	22 02.9
5	6 55 23.86	12.963	22 20 30.2	9.84	22 04.1
6	7 00 34.88	+12.960	+22 16 14.7	−11.43	22 05.4
7	7 05 45.78	12.953	22 11 21.0	13.02	22 06.6
8	7 10 56.53	12.944	22 05 49.3	14.61	22 07.9
9	7 16 07.08	12.934	21 59 39.6	16.19	22 09.1
10	7 21 17.38	12.922	21 52 52.1	17.76	22 10.3
11	7 26 27.38	+12.909	+21 45 26.9	−19.32	22 11.5
12	7 31 37.03	12.894	21 37 24.1	20.88	22 12.7
13	7 36 46.30	12.877	21 28 44.0	22.44	22 13.9
14	7 41 55.15	12.859	21 19 26.8	23.99	22 15.1
15	7 47 03.54	12.840	21 09 32.8	25.52	22 16.3
16	7 52 11.44	+12.819	+20 59 02.2	−27.04	22 17.5
17	7 57 18.80	12.796	20 47 55.3	28.54	22 18.7
18	8 02 25.60	12.771	20 36 12.4	30.03	22 19.9
19	8 07 31.79	12.745	20 23 53.9	31.50	22 21.1
20	8 12 37.36	12.718	20 11 00.2	32.96	22 22.2
21	8 17 42.27	+12.690	+19 57 31.6	−34.40	22 23.3
22	8 22 46.51	12.661	19 43 28.5	35.83	22 24.4
23	8 27 50.04	12.632	19 28 51.3	37.25	22 25.5
24	8 32 52.84	12.601	19 13 40.5	38.65	22 26.6
25	8 37 54.89	12.569	18 57 56.5	40.02	22 27.7
26	8 42 56.16	+12.536	+18 41 39.9	−41.37	22 28.8
27	8 47 56.64	12.503	18 24 51.2	42.70	22 29.8
28	8 52 56.31	12.469	18 07 30.8	44.00	22 30.8
29	8 57 55.15	12.434	17 49 39.3	45.28	22 31.8
30	9 02 53.16	12.399	17 31 17.2	46.54	22 32.8
31	9 07 50.31	+12.363	+17 12 25.1	−47.78	22 33.8
32	9 12 46.60	+12.327	+16 53 03.7	−48.99	22 34.8

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	7.05	6.86	6 69	6.53	6.38	6 24	Semidiameter . .	6.12	6.00	5.89	5.80	5.71	5.62
Hor. Parallax . .	7.25	7.06	6.88	6.72	6.57	6.43	Hor. Parallax . .	6.30	6.18	6.07	5.97	5.88	5.79

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	9 12 46.60	+12.327	+16 53 03.7	−48.99	22 34.8
2	9 17 42.02	12.291	16 33 13.4	50.18	22 35.8
3	9 22 36.56	12.255	16 12 55.0	51.34	22 36.8
4	9 27 30.23	12.218	15 52 09.0	52.47	22 37.7
5	9 32 23.01	12.181	15 30 56.0	53.58	22 38.6
6	9 37 14.90	+12.144	+15 09 16.7	−54.67	22 39.5
7	9 42 05.91	12.107	14 47 11.7	55.73	22 40.4
8	9 46 56.05	12.071	14 24 41.6	56.76	22 41.3
9	9 51 45.34	12.035	14 01 47.1	57.76	22 42.2
10	9 56 33.77	12.000	13 38 28.8	58.74	22 43.1
11	10 01 21.36	+11.966	+13 14 47.4	−59.69	22 43.9
12	10 06 08.12	11.932	12 50 43.5	60.61	22 44.7
13	10 10 54.08	11.899	12 26 17.9	61.50	22 45.5
14	10 15 39.25	11.867	12 01 31.2	62.36	22 46.3
15	10 20 23.64	11.835	11 36 24.0	63.20	22 47.1
16	10 25 07.27	+11.804	+11 10 57.0	−64.01	22 47.9
17	10 29 50.18	11.773	10 45 11.0	64.80	22 48.7
18	10 34 32.39	11.743	10 19 06.6	65.56	22 49.5
19	10 39 13.92	11.715	9 52 44.4	66.29	22 50.2
20	10 43 54.80	11.689	9 26 05.2	66.98	22 50.9
21	10 48 35.06	+11.664	+ 8 59 09.7	−67.64	22 51.6
22	10 53 14.72	11.641	8 31 58.6	68.27	22 52.3
23	10 57 53.82	11.619	8 04 32.5	68.87	22 53.0
24	11 02 32.39	11.598	7 36 52.2	69.45	22 53.7
25	11 07 10.45	11.578	7 08 58.4	70.00	22 54.4
26	11 11 48.04	+11.558	+ 6 40 51.9	−70.52	22 55.0
27	11 16 25.18	11.539	6 12 33.3	71.01	22 55.7
28	11 21 01.91	11.521	5 44 03.4	71.47	22 56.4
29	11 25 38.26	11.505	5 15 22.9	71.90	22 57.0
30	11 30 14.26	11.491	4 46 32.6	72.30	22 57.7
31	11 34 49.95	+11.479	+ 4 17 33.1	−72.66	22 58.3
32	11 39 25.35	+11.470	+ 3 48 25.3	−72.99	22 59.0

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 34 49.95	+11.479	+ 4 17 33.1	−72.66	22 58.3
2	11 39 25.35	11.470	3 48 25.3	72.99	22 59.0
3	11 44 00.50	11.461	3 19 09.8	73.29	22 59.6
4	11 48 35.44	11.453	2 49 47.4	73.56	23 00.3
5	11 53 10.21	11.446	2 20 18.9	73.80	23 00.9
6	11 57 44.83	+11.441	+ 1 50 44.9	−74.01	23 01.5
7	12 02 19.35	11.437	1 21 06.2	74.20	23 02.2
8	12 06 53.81	11.435	0 51 23.5	74.36	23 02.8
9	12 11 28.24	11.435	+ 0 21 37.6	74.48	23 03.5
10	12 16 02.69	11.437	− 0 08 10.8	74.56	23 04.1
11	12 20 37.19	+11.440	− 0 38 01.0	−74.61	23 04.7
12	12 25 11.79	11.445	1 07 52.3	74.62	23 05.4
13	12 29 46.52	11.451	1 37 43.8	74.60	23 06.0
14	12 34 21.43	11.459	2 07 34.9	74.56	23 06.7
15	12 38 56.57	11.469	2 37 24.8	74.50	23 07.3
16	12 43 31.96	+11.481	− 3 07 12.8	−74.42	23 07.9
17	12 48 07.66	11.495	3 36 58.1	74.32	23 08.6
18	12 52 43.71	11.511	4 06 40.0	74.18	23 09.2
19	12 57 20.14	11.529	4 36 17.8	74.00	23 09.9
20	13 01 57.01	11.548	5 05 50.7	73.78	23 10.6
21	13 06 34.35	+11.568	− 5 35 17.8	−73.52	23 11.3
22	13 11 12.20	11.589	6 04 38.6	73.22	23 12.0
23	13 15 50.61	11.611	6 33 52.2	72.89	23 12.7
24	13 20 29.60	11.635	7 02 57.7	72.53	23 13.4
25	13 25 09.24	11.662	7 31 54.5	72.15	23 14.1
26	13 29 49.53	+11.692	− 8 00 41.8	−71.74	23 14.9
27	13 34 30.53	11.724	8 29 18.8	71.31	23 15.6
28	13 39 12.26	11.757	8 57 44.7	70.84	23 16.4
29	13 43 54.76	11.790	9 25 58.6	70.33	23 17.2
30	13 48 38.06	11.824	9 53 59.8	69.78	23 18.0
31	13 53 22.20	+11.859	−10 21 47.5	−69.20	23 18.8
32	13 58 07.20	+11.894	−10 49 20.9	−68.58	23 19.6

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . .	5.54	5.48	5.41	5.35	5.30	5.25	Semidiameter . .	5.21	5.17	5.14	5.11	5.08	5.06
Hor. Parallax . .	5.71	5.64	5.57	5.51	5.46	5.41	Hor. Parallax . .	5.36	5.32	5.29	5.26	5.23	5.20

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.   DECEMBER.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	13 58 07.20	+11.894	− 10 49 20.9	−68.58	23 19.6	1	16 29 05.56	+13.307	−21 39 06.4	−34.89	23 52.9
2	14 02 53.10	11.931	11 16 39.2	67.93	23 20.4	2	16 34 25.46	13.349	21 52 44.7	33.29	23 54.3
3	14 07 39.93	11.969	11 43 41.5	67.26	23 21.2	3	16 39 46.36	13.389	22 05 44.4	31.67	23 55.7
4	14 12 27.71	12.009	12 10 27.1	66.55	23 22.1	4	16 45 08.22	13.428	22 18 04.9	30.03	23 57.1
5	14 17 16.47	12.051	12 36 55.2	65.80	23 23.0	5	16 50 31.00	13.466	22 29 45.7	28.37	23 58.6
6	14 22 06.24	+12.095	− 13 03 05.0	−65.01	23 23.9	6	16 55 54.66	+13.503	−22 40 46.3	−26.68	
7	14 26 57.04	12.140	13 28 55.6	64.19	23 24.8	7	17 01 19.15	13.538	22 51 06.1	24.97	0 00.0
8	14 31 48.90	12.185	13 54 26.2	63.34	23 25.7	8	17 06 44.43	13.570	23 00 44.8	23.24	0 01.5
9	14 36 41.84	12.231	14 19 36.1	62.46	23 26.7	9	17 12 10.45	13.600	23 09 41.8	21.49	0 03.0
10	14 41 35.89	12.277	14 44 24.4	61.55	23 27.7	10	17 17 37.15	13.627	23 17 56.7	19.73	0 04.5
11	14 46 31.06	+12.323	− 15 08 50.4	−60.60	23 28.7	11	17 23 04.49	+13.651	−23 25 29.0	−17.95	0 06.0
12	14 51 27.37	12.371	15 32 53.2	59.62	23 29.7	12	17 28 32.41	13.673	23 32 18.5	16.16	0 07.5
13	14 56 24.84	12.420	15 56 32.0	58.61	23 30.7	13	17 34 00.85	13.693	23 38 24.8	14.36	0 09.0
14	15 01 23.48	12.469	16 19 46.0	57.56	23 31.8	14	17 39 29.76	13.711	23 43 47.6	12.54	0 10.5
15	15 06 23.32	12.519	16 42 34.5	56.48	23 32.9	15	17 44 59.09	13.728	23 48 26.6	10.71	0 12.1
16	15 11 24.36	+12.569	− 17 04 56.7	−55.36	23 34.0	16	17 50 28.77	+13.743	−23 52 21.5	− 8.87	0 13.7
17	15 16 26.62	12.620	17 26 51.7	54.20	23 35.1	17	17 55 58.75	13.755	23 55 32.2	7.02	0 15.2
18	15 21 30.11	12.671	17 48 18.8	53.02	23 36.2	18	18 01 28.96	13.764	23 57 58.5	5.17	0 16.8
19	15 26 34.83	12.722	18 09 17.2	51.81	23 37.4	19	18 06 59.35	13.770	23 59 40.2	3.31	0 18.4
20	15 31 40.78	12.774	18 29 46.1	50.57	23 38.6	20	18 12 29.84	13.773	24 00 37.3	− 1.45	0 19.9
21	15 36 47.96	+12.825	− 18 49 44.8	−49.30	23 39.8	21	18 18 00.38	+13.772	−24 00 49.7	+ 0.42	0 21.5
22	15 41 56.38	12.876	19 09 12.5	48.00	23 41.0	22	18 23 30.91	13.769	24 00 17.3	2.29	0 23.1
23	15 47 06.03	12.927	19 28 08.5	46.66	23 42.2	23	18 29 01.35	13.764	23 59 00.1	4.16	0 24.7
24	15 52 16.89	12.977	19 46 32.0	45.29	23 43.5	24	18 34 31.63	13.757	23 56 58.2	6.02	0 26.3
25	15 57 28.96	13.027	20 04 22.3	43.89	23 44.8	25	18 40 01.70	13.747	23 54 11.7	7.87	0 27.8
26	16 02 42.21	+13.077	− 20 21 38.6	−42.46	23 46.1	26	18 45 31.49	+13.735	−23 50 40.6	+ 9.72	0 29.4
27	16 07 56.64	13.126	20 38 20.2	41.00	23 47.4	27	18 51 00.93	13.720	23 46 25.1	11.56	0 30.9
28	16 13 12.21	13.174	20 54 26.5	39.51	23 48.7	28	18 56 29.96	13.702	23 41 25.5	13.39	0 32.5
29	16 18 28.91	13.220	21 09 56.7	38.00	23 50.1	29	19 01 58.51	13.681	23 35 41.8	15.22	0 34.0
30	16 23 46.70	13.264	21 24 50.2	36.46	23 51.5	30	19 07 26.52	13.657	23 29 14.4	17.04	0 35.5
31	16 29 05.56	+13.307	− 21 39 06.4	−34.89	23 52.9	31	19 12 53.93	+13.629	−23 22 03.5	+18.85	0 37.0
32	16 34 25.46	+13.349	− 21 52 44.7	−33.29	23 54.3	32	19 18 20.69	+13.600	−23 14 09.5	+20.64	0 38.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″		″	″	″	″	″	″	″
Semidiameter	5.04	5.02	5.01	5.00	4.99	4.99	Semidiameter	5.00	5.00	5.01	5.01	5.02	5.04	5.06
Hor. Parallax	5.18	5.17	5.16	5.15	5.15	5.14	Hor. Parallax	5.14	5.14	5.15	5.16	5.17	5.19	5.21

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	20 08 07.48	+8.231	− 21 20 23.5	+24.85	1 27.3
2	20 11 24.87	8.217	21 10 19.9	25.45	1 26.6
3	20 14 41.92	8.203	21 00 02.0	26.04	1 26.0
4	20 17 58.62	8.189	20 49 30.0	26.63	1 25.3
5	20 21 14.97	8.174	20 38 43.9	27.21	1 24.6
6	20 24 30.96	+8.159	− 20 27 44.0	+27.78	1 24.0
7	20 27 46.58	8.143	20 16 30.4	28.34	1 23.3
8	20 31 01.82	8.127	20 05 03.2	28.90	1 22.6
9	20 34 16.68	8.111	19 53 22.7	29.46	1 21.9
10	20 37 31.14	8.094	19 41 29.0	30.01	1 21.2
11	20 40 45.20	+8.077	− 19 29 22.3	+30.55	1 20.5
12	20 43 58.84	8.060	19 17 02.8	31.08	1 19.8
13	20 47 12.07	8.043	19 04 30.7	31.60	1 19.1
14	20 50 24.87	8.025	18 51 46.1	32.11	1 18.4
15	20 53 37.25	8.007	18 38 49.2	32.62	1 17.6
16	20 56 49.19	+7.989	− 18 25 40.3	+33.12	1 16.9
17	21 00 00.69	7.971	18 12 19.5	33.61	1 16.1
18	21 03 11.75	7.952	17 58 47.0	34.09	1 15.4
19	21 06 22.35	7.933	17 45 03.0	34.57	1 14.6
20	21 09 32.51	7.914	17 31 07.7	35.04	1 13.8
21	21 12 42.22	+7.895	− 17 17 01.3	+35.50	1 13.0
22	21 15 51.48	7.876	17 02 43.9	35.95	1 12.2
23	21 19 00.28	7.857	16 48 15.8	36.39	1 11.4
24	21 22 08.64	7.838	16 33 37.2	36.82	1 10.6
25	21 25 16.55	7.820	16 18 48.2	37.25	1 09.8
26	21 28 24.01	+7.801	− 16 03 49.0	+37.67	1 09.0
27	21 31 31.03	7.782	15 48 39.8	38.08	1 08.1
28	21 34 37.60	7.764	15 33 20.9	38.48	1 07.3
29	21 37 43.73	7.746	15 17 52.4	38.88	1 06.5
30	21 40 49.43	7.728	15 02 14.6	39.27	1 05.6
31	21 43 54.69	+7.710	− 14 46 27.6	+39.65	1 04.8
32	21 46 59.52	+7.692	− 14 30 31.7	+40.02	1 03.9

FEBRUARY.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 46 59.52	+7.692	− 14 30 31.7	+40.02	1 03.9
2	21 50 03.91	7.674	14 14 27.0	40.38	1 03.1
3	21 53 07.88	7.656	13 58 13.8	40.73	1 02.2
4	21 56 11.42	7.639	13 41 52.3	41.06	1 01.3
5	21 59 14.54	7.621	13 25 22.7	41.39	1 00.4
6	22 02 17.24	+7.603	− 13 08 45.2	+41.71	0 59.5
7	22 05 19.52	7.586	12 52 00.1	42.03	0 58.6
8	22 08 21.38	7.569	12 35 07.5	42.34	0 57.7
9	22 11 22.83	7.552	12 18 07.7	42.64	0 56.8
10	22 14 23.87	7.535	12 01 00.9	42.93	0 55.9
11	22 17 24.50	+7.518	− 11 43 47.3	+43.21	0 54.9
12	22 20 24.72	7.501	11 26 27.2	43.48	0 54.0
13	22 23 24.54	7.484	11 09 00.7	43.74	0 53.0
14	22 26 23.97	7.468	10 51 28.1	43.98	0 52.1
15	22 29 23.00	7.452	10 33 49.6	44.21	0 51.2
16	22 32 21.65	+7.436	− 10 16 05.4	+44.44	0 50.2
17	22 35 19.91	7.420	9 58 15.8	44.66	0 49.2
18	22 38 17.80	7.404	9 40 20.9	44.88	0 48.2
19	22 41 15.31	7.389	9 22 20.9	45.10	0 47.2
20	22 44 12.46	7.374	9 04 16.0	45.30	0 46.2
21	22 47 09.26	+7.360	− 8 46 06.5	+45.49	0 45.2
22	22 50 05.71	7.346	8 27 52.5	45.67	0 44.2
23	22 53 01.83	7.332	8 09 34.3	45.84	0 43.2
24	22 55 57.62	7.318	7 51 12.0	46.01	0 42.2
25	22 58 53.09	7.305	7 32 45.8	46.17	0 41.2
26	23 01 48.25	+7.292	− 7 14 15.9	+46.32	0 40.2
27	23 04 43.11	7.280	6 55 42.6	46.46	0 39.2
28	23 07 37.68	7.268	6 37 06.0	46.59	0 38.2
29	23 10 31.96	7.256	6 18 26.3	46.71	0 37.1
30	23 13 25.96	7.245	5 59 43.8	46.82	0 36.1
31	23 16 19.69	+7.234	− 5 40 58.6	+46.93	0 35.0
32	23 19 13.16	+7.224	− 5 22 10.9	+47.03	0 34.0

Day of the Month.	0.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″	″
Semidiameter .	2.22	2.21	2.20	2.19	2.19	2.18	2.17
Hor. Parallax .	3.87	3.85	3.84	3.82	3.81	3.80	3.79

Day of the Month.	4th.	9th.	14th.	19th.	24th.
	″	″	″	″	″
Semidiameter .	2.16	2.16	2.15	2.15	2.14
Hor. Parallax .	3.77	3.76	3.75	3.74	3 72

Note.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 10 31.96	+7.256	−6 18 26.3	+46.71	0 37.1
2	23 13 25.96	7.245	5 59 43.8	46.82	0 36.1
3	23 16 19.69	7.234	5 40 58.6	46.93	0 35.0
4	23 19 13.16	7.224	5 22 10.9	47.03	0 34.0
5	23 22 06.38	7.214	5 03 21.0	47.12	0 32.9
6	23 24 59.35	+7.204	−4 44 29.0	+47.20	0 31.8
7	23 27 52.08	7.194	4 25 35.2	47.27	0 30.8
8	23 30 44.58	7.184	4 06 39.8	47.33	0 29.7
9	23 33 36.86	7.174	3 47 42.9	47.39	0 28.7
10	23 36 28.92	7.164	3 28 44.8	47.44	0 27.6
11	23 39 20.76	+7.155	−3 09 45.7	+47.48	0 26.5
12	23 42 12.40	7.147	2 50 45.8	47.51	0 25.4
13	23 45 03.84	7.139	2 31 45.3	47.53	0 24.3
14	23 47 55.08	7.131	2 12 44.3	47.54	0 23.2
15	23 50 46.14	7.124	1 53 43.1	47.54	0 22.1
16	23 53 37.02	+7.117	−1 34 42.0	+47.54	0 21.0
17	23 56 27.73	7.110	1 15 41.0	47.53	0 19.9
18	23 59 18.28	7.103	0 56 40.3	47.51	0 18.8
19	0 02 08.67	7.097	0 37 40.2	47.48	0 17.7
20	0 04 58.92	7.091	−0 18 40.9	47.45	0 16.6
21	0 07 49.03	+7.085	+0 00 17.5	+47.41	0 15.5
22	0 10 39.01	7.080	0 19 14.9	47.36	0 14.4
23	0 13 28.88	7.076	0 38 11.0	47.31	0 13.3
24	0 16 18.64	7.072	0 57 05.7	47.25	0 12.2
25	0 19 08.30	7.068	1 15 58.8	47.18	0 11.1
26	0 21 57.87	+7.064	+1 34 50.1	+47.10	0 10.0
27	0 24 47.37	7.061	1 53 39.5	47.01	0 08.9
28	0 27 36.80	7.058	2 12 26.7	46.92	0 07.8
29	0 30 26.17	7.056	2 31 11.6	46.82	0 06.7
30	0 33 15.49	7.054	2 49 54.0	46.71	0 05.6
31	0 36 04.76	+7.052	+3 08 33.8	+46.60	0 04.4
32	0 38 54.00	+7.051	+3 27 10.7	+46.48	0 03.3

APRIL.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	0 38 54.00	+7.051	+3 27 10.7	+46.48	0 03.3
2	0 41 43.22	7.050	3 45 44.7	46.35	0 02.2
3	0 44 32.42	7.050	4 04 15.5	46.21	{ 0 01.0 / 23 59.9 }
4	0 47 21.60	7.049	4 22 42.9	46.07	23 58.8
5	0 50 10.78	7.049	4 41 06.8	45.92	23 57.7
6	0 52 59.97	+7.049	+4 59 27.0	+45.76	23 56.6
7	0 55 49.16	7.050	5 17 43.3	45.59	23 55.5
8	0 58 38.37	7.050	5 35 55.6	45.42	23 54.4
9	1 01 27.60	7.051	5 54 03.7	45.24	23 53.2
10	1 04 16.85	7.052	6 12 07.3	45.05	23 52.1
11	1 07 06.12	+7.054	+6 30 06.3	+44.85	23 51.0
12	1 09 55.43	7.055	6 48 00.6	44.65	23 49.9
13	1 12 44.78	7.057	7 05 50.0	44.44	23 48.8
14	1 15 34.17	7.059	7 23 34.3	44.23	23 47.6
15	1 18 23.62	7.061	7 41 13.4	44.02	23 46.5
16	1 21 13.12	+7.064	+7 58 47.1	+43.79	23 45.4
17	1 24 02.69	7.067	8 16 15.2	43.55	23 44.2
18	1 26 52.32	7.070	8 33 37.7	43.31	23 43.1
19	1 29 42.03	7.073	8 50 54.3	43.06	23 42.0
20	1 32 31.83	7.077	9 08 04.9	42.81	23 40.9
21	1 35 21.73	+7.081	+9 25 09.4	+42.55	23 39.8
22	1 38 11.72	7.085	9 42 07.6	42.28	23 38.7
23	1 41 01.81	7.090	9 58 59.3	42.01	23 37.6
24	1 43 52.02	7.095	10 15 44.4	41.74	23 36.5
25	1 46 42.35	7.100	10 32 22.8	41.46	23 35.4
26	1 49 32.81	+7.105	+10 48 54.4	+41.17	23 34.3
27	1 52 23.40	7.111	11 05 18.9	40.87	23 33.2
28	1 55 14.13	7.117	11 21 36.3	40.57	23 32.1
29	1 58 04.99	7.123	11 37 46.4	40.26	23 31.0
30	2 00 56.01	7.129	11 53 49.1	39.95	23 29.9
31	2 03 47.18	+7.135	+12 09 44.2	+39.63	23 28.8
32	2 06 38.50	+7.141	+12 25 31.6	+39.30	23 27.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter	2.13	2.12	2.12	2.11	2.11	2.10	2.10
Hor.Parallax	3.72	3.71	3.70	3.69	3.68	3.67	3.66

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	2 09	2.09	2.08	2.08	2.08	2.08
Hor. Parallax . .	3.65	3.65	3.64	3.64	3.63	3.63

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

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MARS, 1902.

GREENWICH MEAN TIME.

	MAY.						JUNE.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	2 03 47.18	+7.135	+12 09 44.2	+39.63	23 28.8	1	3 33 37.70	+7.360	+19 08 35.3	+27.15	22 56.5
2	2 06 38.50	7.141	12 25 31.6	39.30	23 27.7	2	3 36 34.44	7.367	19 19 21.2	26.68	22 55.5
3	2 09 29.98	7.148	12 41 11.1	38.97	23 26.6	3	3 39 31.34	7.374	19 29 55.8	26.20	22 54.5
4	2 12 21.63	7.155	12 56 42.6	38.64	23 25.6	4	3 42 28.40	7.381	19 40 18.8	25.72	22 53.5
5	2 15 13.44	7.162	13 12 06.0	38.30	23 24.5	5	3 45 25.62	7.387	19 50 30.4	25.24	22 52.5
6	2 18 05.42	+7.169	+13 27 21.1	+37.95	23 23.4	6	3 48 22.99	+7.393	+20 00 30.3	+24.75	22 51.5
7	2 20 57.56	7.176	13 42 27.8	37.59	23 22.3	7	3 51 20.50	7.399	20 10 18.4	24.26	22 50.6
8	2 23 49.87	7.183	13 57 25.9	37.23	23 21.2	8	3 54 18.15	7.405	20 19 54.7	23.77	22 49.6
9	2 26 42.34	7.190	14 12 15.4	36.87	23 20.2	9	3 57 15.92	7.410	20 29 19.2	23.27	22 48.6
10	2 29 34.98	7.197	14 26 56.0	36.50	23 19.1	10	4 00 13.82	7.415	20 38 31.7	22.77	22 47.7
11	2 32 27.80	+7.204	+14 41 27.6	+36.12	23 18.1	11	4 03 11.83	+7.420	+20 47 32.1	+22.27	22 46.7
12	2 35 20.78	7.211	14 55 50.2	35.74	23 17.0	12	4 06 09.96	7.425	20 56 20.5	21.76	22 45.8
13	2 38 13.93	7.218	15 10 03.5	35.35	23 16.0	13	4 09 08.19	7.429	21 04 56.7	21.25	22 44.8
14	2 41 07.25	7.225	15 24 07.5	34.96	23 14.9	14	4 12 06.53	7.433	21 13 20.7	20.74	22 43.9
15	2 44 00.74	7.233	15 38 02.0	34.57	23 13.9	15	4 15 04.96	7.437	21 21 32.4	20.23	22 42.9
16	2 46 54.41	+7.240	+15 51 47.0	+34.17	23 12.8	16	4 18 03.49	+7.441	+21 29 31.9	+19.72	22 42.0
17	2 49 48.25	7.248	16 05 22.3	33.76	23 11.8	17	4 21 02.10	7.444	21 37 18.9	19.20	22 41.0
18	2 52 42.27	7.255	16 18 47.7	33.35	23 10.7	18	4 24 00.79	7.447	21 44 53.6	18.68	22 40.0
19	2 55 36.46	7.262	16 32 03.2	32.94	23 09.7	19	4 26 59.56	7.450	21 52 15.7	18.16	22 39.1
20	2 58 30.84	7.270	16 45 08.7	32.52	23 08.7	20	4 29 58.40	7.453	21 59 25.4	17.64	22 38.1
21	3 01 25.40	+7.277	+16 58 04.1	+32.09	23 07.6	21	4 32 57.31	+7.456	+22 06 22.5	+17.12	22 37.2
22	3 04 20.15	7.284	17 10 49.2	31.66	23 06.6	22	4 35 56.28	7.458	22 13 07.0	16.60	22 36.2
23	3 07 15.08	7.292	17 23 24.0	31.23	23 05.6	23	4 38 55.30	7.460	22 19 38.9	16.07	22 35.2
24	3 10 10.19	7.300	17 35 48.4	30.79	23 04.6	24	4 41 54.37	7.462	22 25 58.2	15.54	22 34.3
25	3 13 05.49	7.308	17 48 02.2	30.35	23 03.6	25	4 44 53.48	7.464	22 32 04.8	15.01	22 33.3
26	3 16 00.97	+7.316	+18 00 05.4	+29.90	23 02.6	26	4 47 52.63	+7.465	+22 37 58.7	+14.48	22 32.4
27	3 18 56.64	7.323	18 11 57.8	29.45	23 01.6	27	4 50 51.80	7.466	22 43 39.8	13.95	22 31.4
28	3 21 52.49	7.331	18 23 39.4	29.00	23 00.5	28	4 53 50.99	7.467	22 49 08.2	13.42	22 30.4
29	3 24 48.52	7.339	18 35 10.0	28.55	22 59.5	29	4 56 50.19	7.467	22 54 23.9	12.89	22 29.5
30	3 27 44.74	7.346	18 46 29.6	28.09	22 58.5	30	4 59 49.39	7.466	22 59 26.7	12.36	22 28.5
31	3 30 41.13	+7.353	+18 57 38.1	+27.62	22 57.5	31	5 02 48.59	+7.466	+23 04 16.8	+11.83	22 27.5
32	3 33 37.70	+7.360	+19 08 35.3	+27.15	22 56.5	32	5 05 47.77	+7.465	+23 08 54.1	+11.30	22 26.6

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . .	2.08	2.08	2.08	2.08	2.08	2.08	Semidiameter . .	2.08	2.08	2.09	2.09	2.09	2 10
Hor. Parallax . .	3.63	3.62	3.62	3.62	3.62	3.62	Hor. Parallax . .	3.63	3.63	3.63	3.64	3.65	3.66

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

	JULY.						AUGUST.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	5 02 48.59	+7.466	+23 04 16.8	+11.83	22 27.5	1	6 34 25.21	+7.251	+23 49 17.2	− 4.34	21 56.8
2	5 05 47.77	7.465	23 08 54.1	11.30	22 26.6	2	6 37 19.09	7.238	23 47 27.4	4.82	21 55.8
3	5 08 46.92	7.464	23 13 18.5	10.76	22 25.6	3	6 40 12.65	7.225	23 45 26.0	5.30	21 54.7
4	5 11 46.03	7.462	23 17 30.1	10.22	22 24.7	4	6 43 05.89	7.211	23 43 13.0	5.78	21 53.7
5	5 14 45.08	7.459	23 21 28.9	9.69	22 23.7	5	6 45 58.79	7.197	23 40 48.5	6.26	21 52.6
6	5 17 44.07	+7.456	+23 25 14.9	+ 9.15	22 22.7	6	6 48 51.34	+7.182	+23 38 12.5	− 6.73	21 51.6
7	5 20 42.99	7.453	23 28 48.0	8.62	22 21.8	7	6 51 43.53	7.167	23 35 25.3	7.20	21 50.5
8	5 23 41.82	7.449	23 32 08.3	8.08	22 20.8	8	6 54 35.36	7.152	23 32 26.8	7.67	21 49.4
9	5 26 40.55	7.445	23 35 15.8	7.55	22 19.8	9	6 57 26.82	7.136	23 29 17.1	8.13	21 48.3
10	5 29 39.18	7.440	23 38 10.5	7.02	22 18.9	10	7 00 17.91	7.120	23 25 56.4	8.59	21 47.2
11	5 32 37.69	+7.435	+23 40 52.4	+ 6.48	22 17.9	11	7 03 08 61	+7.104	+23 22 24.7	− 9.05	21 46.1
12	5 35 36.08	7.430	23 43 21.6	5.95	22 16.9	12	7 05 58.93	7.088	23 18 42.1	9.50	21 45.0
13	5 38 34.34	7.424	23 45 38.0	5.42	22 15.9	13	7 08 48.85	7.072	23 14 48.7	9.95	21 43.9
14	5 41 32.45	7.418	23 47 41.7	4.89	22 15.0	14	7 11 38.37	7.055	23 10 44.5	10.39	21 42.7
15	5 44 30.42	7.411	23 49 32.8	4.36	22 14.0	15	7 14 27.48	7.038	23 06 29.7	10.83	21 41.6
16	5 47 28.23	+7.404	+23 51 11.2	+ 3.83	22 13.0	16	7 17 16.19	+7.021	+23 02 04.5	−11.27	21 40.4
17	5 50 25.87	7.397	23 52 36.9	3.30	22 12.0	17	7 20 04.48	7.004	22 57 28.9	11.70	21 39.3
18	5 53 23.34	7.390	23 53 50.0	2.78	22 11.0	18	7 22 52.36	6.986	22 52 42.9	12.13	21 38.1
19	5 56 20.62	7.383	23 54 50.6	2.26	22 10.0	19	7 25 39.81	6.968	22 47 46.7	12.55	21 37.0
20	5 59 17.72	7.375	23 55 38.6	1.74	22 09.0	20	7 28 26.84	6.950	22 42 40.4	12.97	21 35.8
21	6 02 14.62	+7.367	+23 56 14.2	+ 1.22	22 08.0	21	7 31 13.44	+6.932	+22 37 24.0	--13.38	21 34.7
22	6 05 11.32	7.358	23 56 37.4	0.70	22 07.0	22	7 33 59.60	6.914	22 31 57.8	13.79	21 33.5
23	6 08 07.80	7.349	23 56 48.2	+ 0.19	22 06.0	23	7 36 45.33	6.896	22 26 21.8	14.20	21 32.3
24	6 11 04.06	7.340	23 56 46.6	− 0.32	22 05.0	24	7 39 30.61	6.878	22 20 36.1	14.60	21 31.1
25	6 14 00.10	7.330	23 56 32.8	0.83	22 04.0	25	7 42 15.45	6.859	22 14 40.9	15.00	21 29.9
26	6 16 55.90	+7.320	+23 56 06.7	− 1.34	22 03.0	26	7 44 59.84	+6.840	+22 08 36.2	−15.39	21 28.7
27	6 19 51.45	7.309	23 55 28.5	1.85	22 02.0	27	7 47 43.78	6.821	22 02 22.2	15.78	21 27.5
28	6 22 46.75	7.298	23 54 38.2	2.36	22 01.0	28	7 50 27.25	6.802	21 55 58.9	16.16	21 26.3
29	6 25 41.79	7.287	23 53 35.8	2.86	21 59.9	29	7 53 10.25	6.782	21 49 26.6	16.53	21 25.0
30	6 28 36.55	7.275	23 52 21.4	3.36	21 58.9	30	7 55 52.78	6.762	21 42 45.3	16.90	21 23.8
31	6 31 31.03	+ 7.263	+23 50 55.2	− 3.85	21 57.8	31	7 58 34.83	+6.742	+21 35 55.2	−17.27	21 22.5
32	6 34 25.21	+7.251	+23 49 17.2	− 4.34	21 56.8	32	8 01 16.40	+6.722	+21 28 56.4	−17.63	21 21.3

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . .	2.11	2.12	2.12	2.13	2.14	2.16	Semidiameter . .	2.17	2.19	2.20	2.22	2.24	2.27
Hor. Parallax . .	3.67	3.68	3.70	3.72	3.74	3.76	Hor. Parallax . .	3.78	3.81	3.84	3 87	3.90	3.94

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ' "	"	h m
1	8 01 16.40	+6.722	+21 28 56.4	−17.63	21 21.3
2	8 03 57.47	6.701	21 21 49.0	17.99	21 20.1
3	8 06 38.05	6.680	21 14 33.1	18.34	21 18.8
4	8 09 18.13	6.659	21 07 08.9	18.68	21 17.5
5	8 11 57.70	6.638	20 59 36.6	19.02	21 16.2
6	8 14 36.76	+6.617	+20 51 56.1	−19.35	21 14.9
7	8 17 15.31	6.596	20 44 07.7	19.68	21 13.6
8	8 19 53.35	6.575	20 36 11.4	20.00	21 12.3
9	8 22 30.88	6.554	20 28 07.4	20.32	21 11.0
10	8 25 07.89	6.532	20 19 55.8	20.63	21 09.7
11	8 27 44.39	+6.511	+20 11 36.7	−20.94	21 08.3
12	8 30 20.37	6.489	20 03 10.3	21.25	21 07.0
13	8 32 55.84	6.468	19 54 36.6	21.55	21 05.6
14	8 35 30.80	6.446	19 45 55.9	21.85	21 04.3
15	8 38 05.24	6.425	19 37 08.1	22.14	21 02.9
16	8 40 39.17	+6.403	+19 28 13.4	−22.42	21 01.5
17	8 43 12.58	6.382	19 19 12.0	22.70	21 00.1
18	8 45 45.48	6.361	19 10 03.9	22.97	20 58.7
19	8 48 17.87	6.339	19 00 49.4	23.24	20 57.3
20	8 50 49.75	6.318	18 51 28.5	23.50	20 55.9
21	8 53 21.12	+6.296	+18 42 01.3	−23.76	20 54.4
22	8 55 51.98	6.275	18 32 28.0	24.01	20 53.0
23	8 58 22.33	6.254	18 22 48.8	24.25	20 51.5
24	9 00 52.17	6.232	18 13 03.7	24.49	20 50.1
25	9 03 21.49	6.211	18 03 12.9	24.73	20 48.6
26	9 05 50.30	+6.189	+17 53 16.5	−24.96	20 47.1
27	9 08 18.59	6.168	17 43 14.7	25.19	20 45.7
28	9 10 46.36	6.146	17 33 07.6	25.41	20 44.2
29	9 13 13.60	6.124	17 22 55.3	25.62	20 42.7
30	9 15 40.32	6.102	17 12 38.0	·25.83	20 41.2
31	9 18 06.51	+6.080	+17 02 15.8	−26.03	20 39.7
32	9 20 32.17	+6.058	+16 51 48.9	−26.22	20 38.2

OCTOBER.

Day of Month	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ' "	"	h m
1	9 18 06.51	+6.080	+17 02 15.8	−26.03	20 39.7
2	9 20 32.17	6.058	16 51 48.9	26.22	20 38.2
3	9 22 57.31	6.036	16 41 17.4	26.41	20 36.6
4	9 25 21.91	6.014	16 30 41.4	26.59	20 35.1
5	9 27 45.98	5.992	16 20 01.1	26.77	20 33.5
6	9 30 09.52	+5.970	+16 09 16.5	−26.94	20 32.0
7	9 32 32.54	5.948	15 58 27.8	27.11	20 30.5
8	9 34 55.03	5.926	15 47 35.1	27.27	20 28.9
9	9 37 16.99	5.904	15 36 38.6	27.43	20 27.3
10	9 39 38.42	5.882	15 25 38.4	27.58	20 25.7
11	9 41 59.33	+5.860	+15 14 34.6	−27.73	20 24.1
12	9 44 19.72	5.839	15 03 27.3	27.87	20 22.5
13	9 46 39.59	5.817	14 52 16.6	28.01	20 20.9
14	9 48 58.94	5.795	14 41 02.7	28.14	20 19.2
15	9 51 17.78	5.774	14 29 45.6	28.27	20 17.6
16	9 53 36.10	+5.753	+14 18 25.6	−28.39	20 15.9
17	9 55 53.92	5.732	14 07 02.7	28.51	20 14.3
18	9 58 11.23	5.711	13 55 37.0	28.62	20 12.6
19	10 00 28.04	5.690	13 44 08.7	28.73	20 11.0
20	10 02 44.35	5.669	13 32 37.9	28.83	20 09.3
21	10 05 00.15	+5.648	+13 21 04.7	−28.93	20 07.6
22	10 07 15.45	5.627	13 09 29.2	29.02	20 05.9
23	10 09 30.24	5.606	12 57 51.7	29.10	20 04.2
24	10 11 44.53	5.585	12 46 12.2	29.18	20 02.5
25	10 13 58.31	5.564	12 34 30.9	29.25	20 00.8
26	10 16 11.58	+5.542	+12 22 47.9	−29.32	19 59.1
27	10 18 24.33	5.520	12 11 03.3	29.39	19 57.4
28	10 20 36.56	5.499	11 59 17.4	29.45	19 55.6
29	10 22 48.28	5.477	11 47 30.2	29.50	19 53.9
30	10 24 59.48	5.456	11 35 41.9	29.54	19 52.1
31	10 27 10.15	+5.434	+11 23 52.5	−29.58	19 50.3
32	10 29 20.29	+5.412	+11 12 02.3	−29.61	19 48.5

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	2.29	2.31	2.34	2.37	2.40	2.44
Hor. Parallax . .	3.98	4.03	4.07	4.12	4.18	4.24

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	2.47	2.51	2.55	2.60	2.65	2.71
Hor. Parallax . .	4.30	4.36	4.44	4.53	4.62	4.71

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ' "	"	h m
1	10 29 20.29	+5.412	+11 12 02.3	−29.61	19 48.5
2	10 31 29.91	5.390	11 00 11.4	29.64	19 46.7
3	10 33 39.00	5.368	10 48 19.9	29.66	19 44.9
4	10 35 47.56	5.346	10 36 27.9	29.68	19 43.1
5	10 37 55.59	5.324	10 24 35.5	29.69	19 41.3
6	10 40 03.10	+5.302	+10 12 42.9	−29.69	19 39.5
7	10 42 10.07	5.280	10 00 50.2	29.69	19 37.7
8	10 44 16.51	5.258	9 48 57.4	29.69	19 35.9
9	10 46 22.42	5.236	9 37 04.8	29.68	19 34.0
10	10 48 27.80	5.214	9 25 12.4	29.67	19 32.1
11	10 50 32.65	+5.192	+ 9 13 20.4	−29.66	19 30.3
12	10 52 36.98	5.170	9 01 28.9	29.64	19 28.4
13	10 54 40.78	5.148	8 49 38.0	29.62	19 26.5
14	10 56 44.04	5.126	8 37 47.7	29.59	19 24.6
15	10 58 46.78	5.104	8 25 58.2	29.55	19 22.7
16	11 00 48.98	+5.081	+ 8 14 09.7	−29.50	19 20.8
17	11 02 50.66	5.059	8 02 22.2	29.45	19 18.9
18	11 04 51.80	5.036	7 50 36.0	29.40	19 17.0
19	11 06 52.40	5.014	7 38 51.1	29.34	19 15.0
20	11 08 52.46	4.991	7 27 07.6	29.28	19 13.1
21	11 10 51.97	+4.968	+ 7 15 25.8	−29.21	19 11.1
22	11 12 50.93	4.945	7 03 45.7	29.13	19 09.1
23	11 14 49.32	4.921	6 52 07.5	29.05	19 07.1
24	11 16 47.14	4.897	6 40 31.4	28.96	19 05.2
25	11 18 44.39	4.873	6 28 57.4	28.86	19 03.2
26	11 20 41.05	+4.849	+ 6 17 25.8	−28.76	19 01.2
27	11 22 37.12	4.824	6 05 56.6	28.65	18 59.2
28	11 24 32.58	4.799	5 54 30.1	28.54	18 57.2
29	11 26 27.44	4.773	5 43 06.4	28.42	18 55.2
30	11 28 21.68	4.747	5 31 45.4	28.30	18 53.1
31	11 30 15.30	+4.721	+ 5 20 27.5	−28.18	18 51.0
32	11 32 08.30	+4.695	+ 5 09 12.7	−28.05	18 48.9

DECEMBER.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ' "	"	h m
1	11 30 15.30	+4.721	+5 20 27.5	−28.18	18 51.0
2	11 32 08.30	4.695	5 09 12.7	28.05	18 48.9
3	11 34 00.65	4.668	4 58 01.2	27.91	18 46.8
4	11 35 52.37	4.641	4 46 53.1	27.77	18 44.7
5	11 37 43.44	4.614	4 35 48.5	27.62	18 42.7
6	11 39 33.85	+4.587	+4 24 47.6	−27.46	18 40.6
7	11 41 23.60	4.559	4 13 50.5	27.30	18 38.5
8	11 43 12.67	4.531	4 02 57.2	27.13	18 36.4
9	11 45 01.07	4.503	3 52 08.0	26.96	18 34.2
10	11 46 48.78	4.474	3 41 22.9	26.79	18 32.0
11	11 48 35.80	+4.445	+3 30 42.1	−26.61	18 29.9
12	11 50 22.12	4.415	3 20 05.6	26.42	18 27.7
13	11 52 07.73	4.385	3 09 33.6	26.23	18 25.5
14	11 53 52.63	4.355	2 59 06.3	26.03	18 23.3
15	11 55 36.80	4.325	2 48 43.8	25.83	18 21.1
16	11 57 20.24	+4.294	+2 38 26.1	−25.63	18 18.9
17	11 59 02.93	4.262	2 28 13.4	25.42	18 16.7
18	12 00 44.85	4.230	2 18 06.0	25.20	18 14.5
19	12 02 26.00	4.197	2 08 03.9	24.97	18 12.2
20	12 04 06.35	4.164	1 58 07.4	24.74	18 09.9
21	12 05 45.88	+4.131	+1 48 16.5	−24.50	18 07.6
22	12 07 24.59	4.097	1 38 31.5	24.25	18 05.3
23	12 09 02.45	4.061	1 28 52.5	23.99	18 03.0
24	12 10 39.44	4.024	1 19 19.7	23.73	18 00.6
25	12 12 15.54	3.986	1 09 53.2	23.47	17 58.3
26	12 13 50.73	+3.947	+1 00 33.1	−23.20	17 55.9
27	12 15 24.99	3.908	0 51 19.7	22.92	17 53.5
28	12 16 58.31	3.868	0 42 13.1	22.63	17 51.1
29	12 18 30.66	3.827	0 33 13.4	22.34	17 48.7
30	12 20 02.02	3.785	0 24 20.8	22.04	17 46.3
31	12 21 32.37	+3.743	+0 15 35.5	−21.73	17 43.8
32	12 23 01.68	+3.700	+0 06 57.6	−21.42	17 41.4

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter	2.77	2.83	2 90	2.97	3.05	3 14
Hor. Parallax	4.81	4 93	5.05	5.17	5.31	5.46

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st
Semidiameter	3 24	3.34	3.44	3.55	3.68	3.82	3.96
Hor. Parallax	5.62	5.79	5.98	6.19	6.41	6.64	6.89

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

JUPITER, 1902.

GREENWICH MEAN TIME.

JANUARY.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 33 09.89	+2.478	−21 59 52.9	+5.28	0 52.3
2	19 34 09.40	2.481	21 57 45.6	5.34	0 49.3
3	19 35 08.97	2.483	21 55 36.8	5.40	0 46.4
4	19 36 08.60	2.485	21 53 26.5	5.46	0 43.4
5	19 37 08.27	2.487	21 51 14.7	5.52	0 40.4
6	19 38 07.97	+2.488	−21 49 01.5	+5.58	0 37.5
7	19 39 07.70	2.489	21 46 46.9	5.64	0 34.6
8	19 40 07.47	2.490	21 44 30.8	5.70	0 31.7
9	19 41 07.26	2.491	21 42 13.3	5.76	0 28.7
10	19 42 07.05	2.491	21 39 54.4	5.82	0 25.8
11	19 43 06.84	+2.491	−21 37 34.1	+5.88	0 22.8
12	19 44 06.63	2.491	21 35 12.5	5.93	0 19.9
13	19 45 06.42	2.490	21 32 49.5	5.99	0 16.9
14	19 46 06.19	2.490	21 30 25.2	6.04	0 14.0
15	19 47 05.94	2.489	21 27 59.7	6.09	0 11.0
16	19 48 05.67	+2.488	−21 25 32.9	+6.15	0 08.1
17	19 49 05.36	2.486	21 23 04.7	6.20	0 05.2
18	19 50 05.01	2.484	21 20 35.3	6.25	{ 0 02.3 / 23 59.4 }
19	19 51 04.61	2.482	21 18 04.7	6.30	23 56.4
20	19 52 04.16	2.480	21 15 33.0	6.35	23 53.5
21	19 53 03.66	+2.478	−21 13 00.0	+6.40	23 50.5
22	19 54 03.09	.2.475	21 10 25.9	6.45	23 47.6
23	19 55 02.46	2.472	21 07 50.6	6.50	23 44.6
24	19 56 01.76	2.469	21 05 14.1	6.54	23 41.7
25	19 57 00.99	2.466	21 02 36.5	6.59	23 38.7
26	19 58 00.13	+2.463	−20 59 57.8	+6.64	23 35.8
27	19 58 59.18	2.459	20 57 18.0	6.68	23 32.8
28	19 59 58.15	2.455	20 54 37.2	6.72	23 29.9
29	20 00 57.02	2.451	20 51 55.3	6.76	23 26.9
30	20 01 55.79	2.446	20 49 12.5	6.80	23 23.9
31	20 02 54.45	+2.442	−20 46 28.7	+6.84	23 20.9
32	20 03 53.00	+2.437	−20 43 43.9	+6.88	23 18.0

FEBRUARY.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	20 03 53.00	+2.437	−20 43 43.9	+6.88	23 18.0
2	20 04 51.43	2.432	20 40 58.2	6.92	23 15.0
3	20 05 49.73	2.427	20 38 11.6	6.96	23 12.1
4	20 06 47.90	2.421	20 35 −4.1	7.00	23 09.1
5	20 07 45.94	2.415	20 32 35.7	7.03	23 06.2
6	20 08 43.84	+2.409	−20 29 46.5	+7.06	23 03.2
7	20 09 41.59	2.403	20 26 56.6	7.09	23 00.2
8	20 10 39.18	2.396	20 24 06.0	7.12	22 57.2
9	20 11 36.60	2.389	20 21 14.7	7.15	22 54.2
10	20 12 33.86	2.382	20 18 22.7	7.18	22 51.2
11	20 13 30.94	+2.375	−20 15 30.1	+7.21	22 48.2
12	20 14 27.84	2.367	20 12 36.8	7.24	22 45.2
13	20 15 24.57	2.359	20 09 42.9	7.26	22 42.2
14	20 16 21.09	2.351	20 06 48.4	7.28	22 39.2
15	20 17 17.41	2.343	20 03 53.4	7.30	22 36.2
16	20 18 13.53	+2.335	−20 00 58.0	+7.32	22 33.2
17	20 19 09.46	2.326	19 58 02.1	7.34	22 30.2
18	20 20 05.16	2.317	19 55 05.8	7.36	22 27.2
19	20 21 00.64	2.308	19 52 09.1	7.38	22 24.2
20	20 21 55.90	2.298	19 49 12.0	7.39	22 21.2
21	20 22 50.95	+2.289	−19 46 14.4	+7.40	22 18.2
22	20 23 45.76	2.279	19 43 16.6	7.41	22 15.2
23	20 24 40.33	2.269	19 40 18.6	7.42	22 12.2
24	20 25 34.65	2.259	19 37 20.3	7.43	22 09.1
25	20 26 28.73	2.248	19 34 21.8	7.44	22 06.1
26	20 27 22.56	+2.237	−19 31 23.1	+7.45	22 03.0
27	20 28 16.13	2.227	19 28 24.3	7.45	22 00.0
28	20 29 09.44	2.216	19 25 25.4	7.46	21 56.9
29	20 30 02.50	2.205	19 22 26.4	7.46	21 53.9
30	20 30 55.28	2.193	19 19 27.4	7.46	21 50.8
31	20 31 47.77	+2.181	−19 16 28.5	+7.45	21 47.7
32	20 32 39.97	+2.169	−19 13 29.6	+7.45	21 44.6

Day of the Month.	0.	8th.	16th.	24th.
	″	″	″	″
Semidiameter	15.43	15.38	15.38	15.40
Horizontal Parallax . .	1.45	1.44	1.44	1.44

Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″
Semidiameter	15.46	15.56	15.69	15.85
Horizontal Parallax . .	1.45	1.45	1.46	1.48

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH. / APRIL.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	20 30 02.50	+2.205	−19 22 26.4	+7.46	21 53.9	1	20 54 42.56	+1.738	−17 53 12.0	+6.66	20 16.3
2	20 30 55.28	2.193	19 19 27.4	7.46	21 50.8	2	20 55 24.05	1.719	17 50 32.8	6.61	20 13.1
3	20 31 47.77	2.181	19 16 28.5	7.45	21 47.7	3	20 56 05.68	1.700	17 47 55.0	6.55	20 09.8
4	20 32 39.97	2.169	19 13 29.6	7.45	21 44.6	4	20 56 45.64	1.681	17 45 18.6	6.49	20 06.6
5	20 33 31.89	2.157	19 10 30.7	7.44	21 41.6	5	20 57 25.73	1.661	17 42 43.6	6.43	20 03.3
6	20 34 23.51	+2.145	−19 07 32.0	+7.44	21 38.5	6	20 58 05.35	+1.641	−17 40 10.1	+6.36	20 00.0
7	20 35 14.83	2.132	19 04 33.5	7.43	21 35.4	7	20 58 44.49	1.621	17 37 38.1	6.30	19 56.7
8	20 36 05.84	2.119	19 01 35.3	7.42	21 32.3	8	20 59 23.14	1.601	17 35 07.7	6.23	19 53.4
9	20 36 56.54	2.105	18 58 37.3	7.41	21 29.2	9	21 00 01.30	1.580	17 32 39.0	6.16	19 50.1
10	20 37 46.91	2.091	18 55 39.6	7.40	21 26.1	10	21 00 38.97	1.559	17 30 11.9	6.09	19 46.8
11	20 38 36.95	+2.077	−18 52 42.3	+7.39	21 23.0	11	21 01 16.13	+1.538	−17 27 46.5	+6.02	19 43.5
12	20 39 26.66	2.063	18 49 45.4	7.37	21 19.9	12	21 01 52.77	1.516	17 25 22.9	5.95	19 40.1
13	20 40 16.04	2.049	18 46 48.8	7.35	21 16.8	13	21 02 28.88	1.494	17 23 01.1	5.87	19 36.8
14	20 41 05.06	2.035	18 43 52.8	7.33	21 13.7	14	21 03 04.48	1.472	17 20 41.2	5.79	19 33.4
15	20 41 53.73	2.021	18 40 57.3	7.31	21 10.6	15	21 03 39.56	1.450	17 18 23.1	5.71	19 30.1
16	20 42 42.05	+2.006	−18 38 02.4	+7.28	21 07.4	16	21 04 14.10	+1.428	−17 16 07.0	+5.63	19 26.7
17	20 43 30.01	1.991	18 35 08.0	7.25	21 04.3	17	21 04 48.10	1.406	17 13 52.9	5.55	19 23.3
18	20 44 17.60	1.975	18 32 14.3	7.22	21 01.1	18	21 05 21.55	1.383	17 11 40.7	5.46	19 19.9
19	20 45 04.81	1.959	18 29 21.3	7.19	20 58.0	19	21 05 54.47	1.360	17 09 30.6	5.38	19 16.5
20	20 45 51.65	1.944	18 26 29.0	7.16	20 54.8	20	21 06 26.83	1.337	17 07 22.6	5.29	19 13.1
21	20 46 38.12	+1.928	−18 23 37.4	+7.13	20 51.6	21	21 06 58.63	+1.313	−17 05 16.7	+5.20	19 09.7
22	20 47 24.20	1.912	18 20 46.6	7.10	20 48.4	22	21 07 29.86	1.290	17 03 13.0	5.11	19 06.3
23	20 48 09.88	1.896	18 17 56.7	7.07	20 45.3	23	21 08 00.53	1.266	17 01 11.5	5.01	19 02.9
24	20 48 55.16	1.879	18 15 07.7	7.03	20 42.1	24	21 08 30.62	1.242	16 59 12.4	4.91	18 59.5
25	20 49 40.05	1.862	18 12 19.5	6.99	20 38.9	25	21 09 00.93	1.218	16 57 15.6	4.82	18 56.0
26	20 50 24.54	+1.845	−18 09 32.3	+6.95	20 35.7	26	21 09 29.05	+1.193	−16 55 21.1	+4.72	18 52.6
27	20 51 08.61	1.828	18 06 46.1	6.91	20 32.5	27	21 09 57.39	1.168	16 53 29.0	4.62	18 49.1
28	20 51 52.26	1.810	18 04 01.0	6.86	20 29.2	28	21 10 25.12	1.143	16 51 39.4	4.52	18 45.6
29	20 52 35.48	1.792	18 01 17.0	6.81	20 26.0	29	21 10 52.24	1.118	16 49 52.3	4.41	18 42.1
30	20 53 18.28	1.774	17 58 34.1	6.76	20 22.8	30	21 11 18.76	1.092	16 48 07.8	4.30	18 38.6
31	20 54 00.64	+1.756	−17 55 52.4	+6.71	20 19.6	31	21 11 44.66	+1.066	−16 46 25.8	+4.19	18 35.1
32	20 54 42.56	+1.738	−17 53 12.0	+6.66	20 16.3	32	21 12 09.93	+1.040	−16 44 46.5	+4.08	18 31.6

Day of the Month.	5th.	13th.	21st.	29th.	Day of the Month.	6th.	14th.	22d.	30th.
	″	″	″	″		″	″	″	″
Semidiameter	16.05	16.28	16.56	16.87	Semidiameter	17.21	17.58	17.99	18.43
Horizontal Parallax . .	1.50	1.53	1.55	1.58	Horizontal Parallax . .	1.61	1.64	1.68	1.72

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations are increasing.

JUPITER, 1902.

GREENWICH MEAN TIME.

	MAY.						JUNE.				
Day of Month	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	21 11 44.66	+1.066	−16 46 25.8	+4.19	18 35.1	1	21 19 31.74	+0.162	−16 18 33.2	+0.11	16 40.7
2	21 12 09.93	1.040	16 44 46.5	4.08	18 31.6	2	21 19 35.24	0.130	16 18 32.3	−0.04	16 36.8
3	21 12 34.57	1.013	16 43 09.9	3.97	18 28.0	3	21 19 37.98	0.098	16 18 34.9	0.19	16 32.9
4	21 12 58.58	0.986	16 41 35.9	3.85	18 24.5	4	21 19 39.95	0.066	16 18 41.0	0.34	16 29.0
5	21 13 21.94	0.959	16 40 04.7	3.73	18 21.0	5	21 19 41.16	0.034	16 18 50.6	0.48	16 25.1
6	21 13 44.65	+0.932	−16 38 36.4	+3.61	18 17.4	6	21 19 41.60	+0.002	−16 19 03.8	−0.63	16 21.2
7	21 14 06.70	0.905	16 37 11.0	3.49	18 13.8	7	21 19 41.28	−0.030	16 19 20.5	0.78	16 17.3
8	21 14 28.10	0.878	16 35 48.4	3.37	18 10.2	8	21 19 40.19	0.061	16 19 40.8	0.92	16 13.3
9	21 14 48.83	0.850	16 34 28.8	3.25	18 06.6	9	21 19 38.34	0.093	16 20 04.6	1.07	16 09.3
10	21 15 08.88	0.822	16 33 12.2	3.13	18 03.0	10	21 19 35.72	0.125	16 20 31.9	1.22	16 05.3
11	21 15 28.25	+0.794	−16 31 58.5	+3.01	17 59.4	11	21 19 32.35	−0.156	−16 21 02.8	−1.36	16 01.3
12	21 15 46.94	0.765	16 30 47.8	2.88	17 55.8	12	21 19 28.23	0.188	16 21 37.0	1.51	15 57.3
13	21 16 04.95	0.736	16 29 40.2	2.75	17 52.2	13	21 19 23.33	0.220	16 22 14.7	1.65	15 53.3
14	21 16 22.26	0.707	16 28 35.7	2.62	17 48.5	14	21 19 17.69	0.251	16 22 55.9	1.79	15 49.2
15	21 16 38.88	0.678	16 27 34.3	2.49	17 44.8	15	21 19 11.30	0.282	16 23 40.5	1.93	15 45.2
16	21 16 54.81	+0.649	−16 26 36.1	+2.36	17 41.2	16	21 19 04.16	−0.313	−16 24 28.4	−2.07	15 41.1
17	21 17 10.04	0.620	16 25 41.0	2.23	17 37.5	17	21 18 56.28	0.344	16 25 19.7	2.21	15 37.1
18	21 17 24.56	0.590	16 24 49.1	2.08	17 33.8	18	21 18 47.66	0.375	16 26 14.4	2.35	15 33.0
19	21 17 38.37	0.561	16 24 00.5	1.96	17 30.1	19	21 18 38.31	0.406	16 27 12.4	2.49	15 28.9
20	21 17 51.47	0.531	16 23 15.1	1.82	17 26.4	20	21 18 28.22	0.436	16 28 13.7	2.62	15 24.8
21	21 18 03.85	+0.501	−16 22 33.0	+1.69	17 22.7	21	21 18 17.40	−0.466	−16 29 18.2	−2.76	15 20.7
22	21 18 15.51	0.471	16 21 54.2	1.55	17 18.9	22	21 18 05.85	0.496	16 30 26.0	2.89	15 16.6
23	21 18 26.45	0.441	16 21 18.7	1.41	17 15.1	23	21 17 53.59	0.526	16 31 37.0	3.02	15 12.4
24	21 18 36.67	0.410	16 20 46.6	1.27	17 11.3	24	21 17 40.62	0.556	16 32 51.1	3.15	15 08.2
25	21 18 46.15	0.380	16 20 17.9	1.13	17 07.5	25	21 17 26.94	0.585	16 34 08.3	3.28	15 04.1
26	21 18 54.89	+0.349	−16 19 52.6	+0.99	17 03.7	26	21 17 12.55	−0.614	−16 35 28.6	−3.41	14 59.9
27	21 19 02.90	0.318	16 19 30.7	0.84	16 59.9	27	21 16 57.47	0.643	16 36 51.9	3.54	14 55.7
28	21 19 10.17	0.287	16 19 12.2	0.70	16 56.1	28	21 16 41.70	0.672	16 38 18.2	3.66	14 51.5
29	21 19 16.69	0.256	16 18 57.2	0.55	16 52.3	29	21 16 25.25	0.700	16 39 47.6	3.78	14 47.3
30	21 19 22.46	0.225	16 18 45.7	0.41	16 48.5	30	21 16 08.11	0.728	16 41 19.8	3.90	14 43.1
31	21 19 27.48	+0.194	−16 18 37.7	+0.26	16 44.6	31	21 15 50.31	−0.755	−16 42 54.8	−4.02	14 38.9
32	21 19 31.74	+0.162	−16 18 33.2	+0.11	16 40.7	32	21 15 31.86	−0.782	−16 44 32.5	−4.13	14 34.6

Day of the Month.	8th.	16th.	24th.	Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″		″	″	″	″
Semidiameter	18.90	19.39	19.91	Semidiameter	20.42	20.93	21.44	21.90
Horizontal Parallax	1.77	1.81	1.86	Horizontal Parallax	1.91	1.96	2.00	2.05

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

Day of Month	JULY. Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month	AUGUST. Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	21 15 50.31	−0.755	−16 42 54.8	−4.02	14 38.9	1	21 02 24.13	−1.296	−17 47 57.5	−5.86	12 23.5
2	21 15 31.86	0.782	16 44 32.5	4.13	14 34.6	2	21 01 52.96	1.301	17 50 18.1	5.85	12 19.1
3	21 15 12.77	0.809	16 46 12.9	4.24	14 30.3	3	21 01 21.68	1.305	17 52 38.6	5.84	12 14.6
4	21 14 53.03	0.835	16,47 56.0	4.35	14 26.0	4	21 00 50.32	1.307	17 54 58.8	5.83	12 10.1
5	21 14 32.67	0.861	16 49 41.6	4.45	14 21.8	5	21 00 18.92	1.308	17 57 18.6	5.81	12 05.7
6	21 14 11.70	−0.886	−16 51 29.7	−4.55	14 17.5	6	20 59 47.50	−1.309	−17 59 37.8	−5.79	12 01.2
7	21 13 50.14	0.911	16 53 20.1	4.65	14 13.2	7	20 59 16.08	1.309	18 01 56.4	5.76	11 56.8
8	21 13 27.98	0.935	16 55 12.9	4.75	14 08.9	8	20 58 44.68	1.308	18 04 14.3	5.73	11 52.3
9	21 13 05.26	0.958	16 57 07.9	4.84	14 04.6	9	20 58 13.33	1.305	18 06 31.4	5.69	11 47.8
10	21 12 41.99	0.981	16 59 05.0	4.92	14 00.3	10	20 57 42.05	1.301	18 08 47.6	5.65	11 43.4
11	21 12 18.19	−1.003	−17 01 04.0	−5.00	13 56.0	11	20 57 10.87	−1.297	−18 11 02.8	−5.61	11 38.9
12	21 11 53.86	1.024	17 03 05.1	5.08	13 51.6	12	20 56 39.80	1.292	18 13 16.9	5.56	11 34.5
13	21 11 29.03	1.045	17 05 08.1	5.16	13 47.3	13	20 56 08.88	1.285	18 15 29.8	5.51	11 30.0
14	21 11 03.71	1.065	17 07 12.9	5.23	13 42.9	14	20 55 38.12	1.277	18 17 41.4	5.46	11 25.6
15	21 10 37.90	1.084	17 09 19.3	5.30	13 38.6	15	20 55 07.54	1.269	18 19 51.7	5.40	11 21.1
16	21 10 11.64	−1.103	−17 11 27.4	−5.37	13 34.2	16	20 54 37.17	−1.260	−18 22 00.6	−5.34	11 16.7
17	21 09 44.94	1.121	17 13 37.0	5.43	13 29.8	17	20 54 07.04	1.250	18 24 07.9	5.28	11 12.2
18	21 09 17.82	1.138	17 15 48.0	5.49	13 25 4	18	20 53 37.15	1.239	18 26 13.6	5.21	11 07.8
19	21 08 50.31	1.155	17 18 00.2	5.54	13 21.0	19	20 53 07.53	1.228	18 28 17.7	5.14	11 03.4
20	21 08 22.39	1.171	17 20 13.8	5.59	13 16.6	20	20 52 38.20	1.216	18 30 20.1	5.06	10 59.0
21	21 07 54.11	−1.186	−17 22 28.5	−5.63	13 12.2	21	20 52 09.19	−1.203	−18 32 20.7	−4.98	10 54.6
22	21 07 25.48	1.200	17 24 44.2	5.67	13 07.8	22	20 51 40.51	1.188	18 34 19.3	4.90	10 50.2
23	21 06 56.52	1.213	17 27 00.9	5.71	13 03.4	23	20 51 12.18	1.173	18 36 16.0	4.82	10 45.8
24	21 06 27.24	1.226	17 29 18.5	5.74	12 59.0	24	20 50 44.21	1.157	18 38 10.7	4.74	10 41.4
25	21 05 57.67	1.238	17 31 36.8	5.77	12 54.6	25	20 50 16.64	1.140	18 40 03.3	4.65	10 37.0
26	21 05 27.82	−1.249	−17 33 55.8	−5.80	12 50.1	26	20 49 49.48	−1.122	−18 41 53.7	−4.56	10 32.6
27	21 04 57.72	1.259	17 36 15.3	5.82	12 45.7	27	20 49 22.75	1.104	18 43 41.9	4.47	10 28.2
28	21 04 27.38	1.268	17 38 35.3	5.84	12 41.3	28	20 48 56.48	1.085	18 45 27.9	4.37	10 23.9
29	21 03 56.83	1.277	17 40 55.6	5.85	12 36.9	29	20 48 30.68	1.065	18 47 11.5	4.27	10 19.5
30	21 03 26.09	1.284	17 43 16.1	5.85	12 32.4	30	20 48 05.37	1.044	18 48 52.6	4.17	10 15.2
31	21 02 55.18	−1.290	−17 45 36.8	−5.86	12 28.0	31	20 47 40.56	−1.022	−18 50 31.3	−4.06	10 10.8
32	21 02 24.13	−1.296	−17 47 57.5	−5.86	12 23.5	32	20 47 16.28	−1.000	−18 52 07.5	−3.95	10 06.5

Day of the Month.	3d.	11th.	19th.	27th.	Day of the Month.	4th.	12th.	20th.	28th.
	″	″	″	″		″	″	″	″
Semidiameter	22.32	22.68	22.95	23.14	Semidiameter	23.21	23.18	23.04	22.81
Horizontal Parallax . .	2.09	2.12	2.15	2.16	Horizontal Parallax . .	2.17	2.17	2.16	2.13

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

JUPITER, 1902.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month	Apparent Right Ascension. Noon.	Var of R A for 1 Hour. Noon.	Apparent Declination. Noon.	Var of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	20 47 16.28	− 1.000	− 18 52 07.5	− 3.95	10 06.5
2	20 46 52.55	0.977	18 53 41.1	3.84	10 02.2
3	20 46 29.39	0.953	18 55 12.0	3.73	9 57.9
4	20 46 06.81	0.928	18 56 40.3	3.62	9 53.6
5	20 45 44.82	0.903	18 58 05.9	3.51	9 49.3
6	20 45 23.45	− 0.877	− 18 59 28.7	− 3.39	9 45.0
7	20 45 02.71	0.851	19 00 48.7	3.28	9 40.8
8	20 44 42.61	0.824	19 02 05.9	3.16	9 36.5
9	20 44 23.16	0.797	19 03 20.3	3.04	9 32.3
10	20 44 04.37	0.769	19 04 31.8	2.92	9 28.0
11	20 43 46.26	− 0.740	− 19 05 40.3	− 2.80	9 23.8
12	20 43 28.84	0.711	19 06 45.9	2.67	9 19.6
13	20 43 12.12	0.682	19 07 48.6	2.55	9 15.4
14	20 42 56.12	0.652	19 08 48.3	2.43	9 11.2
15	20 42 40.83	0.622	19 09 45.0	2.30	9 07.0
16	20 42 26.26	− 0.592	− 19 10 38.7	− 2.18	9 02.8
17	20 42 12.42	0.561	19 11 29.5	2.05	8 58.7
18	20 41 59.33	0.530	19 12 17.2	1.92	8 54.5
19	20 41 46.99	0.499	19 13 01.8	1.80	8 50.4
20	20 41 35.40	0.467	19 13 43.4	1.67	8 46.3
21	20 41 24.57	− 0.435	− 19 14 21.9	− 1.54	8 42.2
22	20 41 14.51	0.403	19 14 57.3	1.41	8 38.1
23	20 41 05.23	0.371	19 15 29.6	1.28	8 34.0
24	20 40 56.73	0.338	19 15 58.8	1.15	8 29.9
25	20 40 49.00	0.305	19 16 25.0	1.02	8 25.9
26	20 40 42.07	− 0.272	− 19 16 48.0	− 0.89	8 21.8
27	20 40 35.94	0.239	19 17 07.9	0.76	8 17.8
28	20 40 30.61	0.206	19 17 24.6	0.63	8 13.8
29	20 40 26.09	0.172	19 17 38.2	0.50	8 09.8
30	20 40 22.38	0.138	19 17 48.6	0.37	8 05.8
31	20 40 19.48	− 0.104	− 19 17 55.9	− 0.24	8 01.8
32	20 40 17.39	− 0.070	− 19 18 00.0	− 0.11	7 57.8

OCTOBER.

Day of Month	Apparent Right Ascension. Noon.	Var. of R A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var of Decl. for 1 Hour. Noon.	Meridian Passage
	h m s	s	° ′ ″	″	h m
1	20 40 19.48	− 0.104	− 19 17 55.9	− 0.24	8 01.8
2	20 40 17.39	0.070	19 18 00.0	− 0.11	7 57.8
3	20 40 16.12	0.036	19 18 01.0	+ 0.02	7 53.9
4	20 40 15.67	− 0.002	19 17 58.9	0.15	7 50.0
5	20 40 16.04	+ 0.032	19 17 53.5	0.29	7 46.1
6	20 40 17.23	+ 0.066	− 19 17 45.0	+ 0.42	7 42.2
7	20 40 19.23	0.100	19 17 33.4	0.55	7 38.3
8	20 40 22.05	0.134	19 17 18.6	0.68	7 34.4
9	20 40 25.68	0.168	19 17 00.7	0.81	7 30.5
10	20 40 30.12	0.202	19 16 39.8	0.94	7 26.6
11	20 40 35.38	+ 0.236	− 19 16 15.8	+ 1.07	7 22.8
12	20 40 41.44	0.269	19 15 48.7	1.19	7 19.0
13	20 40 48.30	0.303	19 15 18.5	1.32	7 15.2
14	20 40 55.96	0.336	19 14 45.2	1.45	7 11.4
15	20 41 04.43	0.369	19 14 08.9	1.57	7 07.6
16	20 41 13.68	+ 0.402	− 19 13 29.6	+ 1.70	7 03.8
17	20 41 23.71	0.435	19 12 47.2	1.83	7 00.1
18	20 41 34.53	0.467	19 12 01.8	1.95	6 56.3
19	20 41 46.13	0.500	19 11 13.4	2.08	6 52.6
20	20 41 58.50	0.532	19 10 21.9	2.21	6 48.9
21	20 42 11.64	+ 0.564	− 19 09 27.5	+ 2.33	6 45.2
22	20 42 25.55	0.596	19 08 30.1	2.46	6 41.5
23	20 42 40.22	0.628	19 07 29.7	2.58	6 37.8
24	20 42 55.65	0.659	19 06 26.3	2.70	6 34.2
25	20 43 11.83	0.690	19 05 19.9	2.83	6 30.6
26	20 43 28.76	+ 0.721	− 19 04 10.6	+ 2.95	6 26.9
27	20 43 46.44	0.752	19 02 58.3	3.07	6 23.2
28	20 44 04.86	0.783	19 01 43.0	3.20	6 19.6
29	20 44 24.01	0.814	19 00 24.8	3.32	6 16.0
30	20 44 43.89	0.844	18 59 03.7	3.44	6 12.4
31	20 45 04.50	+ 0.874	− 18 57 39.6	+ 3.56	6 08.8
32	20 45 25.83	+ 0.903	− 18 56 12.5	+ 3.68	6 05.2

Day of the Month.	5th.	13th.	21st.	29th.	Day of the Month.	7th.	15th.	23d.	31st.
	″	″	″	″		″	″	″	″
Semidiameter	22.49	22.10	21.64	21.15	Semidiameter	20.65	20.14	19.63	19.14
Horizontal Parallax . .	2.10	2.07	2.02	1.98	Horizontal Parallax . .	1.93	1.88	1.83	1.79

NOTE.—The sign + indicates north declinations; the sign − indicates south declination.

GREENWICH MEAN TIME.

	NOVEMBER.						DECEMBER				
Day of Month.	Apparent Right Ascension	Var. of R. A. for 1 Hour.	Apparent Declination	Var. of Decl for 1 Hour.	Meridian Passage.	Day of Month	Apparent Right Ascension	Var of R A for 1 Hour	Apparent Declination	Var. of Decl. for 1 Hour	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon	Noon	Noon	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	20 45 25.83	+ 0.903	− 18 56 12.5	+ 3.68	6 05.2	1	21 01 00.34	+ 1.645	− 17 51 19.0	+ 7.06	4 22.8
2	20 45 47.86	0.932	18 54 42.6	3.80	6 01.6	2	21 01 40.06	1.665	17 48 28.4	7.16	4 19.5
3	20 46 10.59	0.961	18 53 09.9	3.92	5 58.0	3	21 02 20.25	1.684	17 45 35.4	7.26	4 16.2
4	20 46 34.01	0.990	18 51 34.4	4.04	5 54.5	4	21 03 00.90	1.703	17 42 39.9	7.36	4 13.0
5	20 46 58.13	1.019	18 49 55.9	4.16	5 51.0	5	21 03 42.00	1.722	17 39 42.0	7.46	4 09.7
6	20 47 22.92	+ 1.047	− 18 48 14.6	+ 4.28	5 47.5	6	21 04 23.55	+ 1.740	− 17 36 41.6	+ 7.56	4 06.5
7	20 47 48.38	1.075	18 46 30.5	4.40	5 44.0	7	21 05 05.54	1.758	17 33 38.9	7.66	4 03.2
8	20 48 14.51	1.102	18 44 43.5	4.51	5 40.5	8	21 05 47.95	1.776	17 30 33.8	7.76	4 00.0
9	20 48 41.29	1.129	18 42 53.8	4.63	5 37.0	9	21 06 30.77	1.793	17 27 26.3	7.86	3 56.8
10	20 49 08.71	1.156	18 41 01.3	4.75	5 33.5	10	21 07 14.01	1.810	17 24 16.3	7.96	3 53.6
11	20 49 36.77	+ 1.183	− 18 39 06.0	+ 4.86	5 30.0	11	21 07 57.65	+ 1.826	− 17 21 04.0	+ 8.06	3 50.4
12	20 50 05.48	1.209	18 37 08.0	4.98	5 26.6	12	21 08 41.68	1.842	17 17 49.5	8.16	3 47.2
13	20 50 34.80	1.235	18 35 07.3	5.09	5 23.1	13	21 09 26.10	1.858	17 14 32.7	8.26	3 44.0
14	20 51 04.73	1.260	18 33 03.9	5.20	5 19.7	14	21 10 10.91	1.874	17 11 13.6	8.35	3 40.8
15	20 51 35.27	1.285	18 30 57.7	5.32	5 16.3	15	21 10 56.08	1.889	17 07 52.2	8.44	3 37.6
16	20 52 06.41	+ 1.310	− 18 28 48.8	+ 5.43	5 12.9	16	21 11 41.61	+ 1.904	− 17 04 28.6	+ 8.53	3 34.4
17	20 52 38.14	1.334	18 26 37.2	5.54	5 09.5	17	21 12 27.50	1.919	17 01 02.8	8.62	3 31.2
18	20 53 10.45	1.358	18 24 23.0	5.65	5 06.1	18	21 13 13.75	1.934	16 57 34.7	8.72	3 28.1
19	20 53 43.33	1.382	18 22 06.1	5.76	5 02.7	19	21 14 00.34	1.948	16 54 04.4	8.81	3 24.9
20	20 54 16.79	1.406	18 19 46.5	5.87	4 59.3	20	21 14 47.26	1.962	16 50 31.9	8.90	3 21.8
21	20 54 50.81	+ 1.429	− 18 17 24.2	+ 5.98	4 55.9	21	21 15 34.52	+ 1.976	− 16 46 57.2	+ 8.99	3 18.6
22	20 55 25.38	1.452	18 14 59.3	6.09	4 52.5	22	21 16 22.11	1.990	16 43 20.3	9.08	3 15.5
23	20 56 00.50	1.475	18 12 31.8	6.20	4 49.2	23	21 17 10.03	2.003	16 39 41.3	9.17	3 12.3
24	20 56 36.17	1.499	18 10 01.8	6.31	4 45.9	24	21 17 58.25	2.016	16 36 00.2	9.26	3 09.2
25	20 57 12.37	1.519	18 07 29.1	6.42	4 42.6	25	21 18 46.77	2.028	16 32 17.0	9.35	3 06.1
26	20 57 49.09	+ 1.541	− 18 04 53.8	+ 6.52	4 39.3	26	21 19 35.58	+ 2.040	− 16 28 31.6	+ 9.43	3 03.0
27	20 58 26.33	1.562	18 02 15.9	6.63	4 36.0	27	21 20 24.69	2.052	16 24 44.2	9.52	2 59.9
28	20 59 04.09	1.583	17 59 35.5	6.74	4 32.7	28	21 21 14.08	2.064	16 20 54.8	9.61	2 56.8
29	20 59 42.35	1.604	17 56 52.5	6.84	4 29.4	29	21 22 03.75	2.075	16 17 03.3	9.69	2 53.7
30	21 00 21.10	1.625	17 54 07.0	6.95	4 26.1	30	21 22 53.70	2.086	16 13 09.8	9.77	2 50.6
31	21 01 00.34	+ 1.645	− 17 51 19.0	+ 7.06	4 22.8	31	21 23 43.90	+ 2.097	− 16 09 14.4	+ 9.85	2 47.5
32	21 01 40.06	+ 1.665	− 17 48 28.4	+ 7.16	4 19.5	32	21 24 34.35	+ 2.107	− 16 05 17.0	+ 9.93	2 44.4

Day of the Month.	8th.	16th.	24th.	Day of the Month.	2d.	10th.	18th.	26th.	34th.
Semidiameter	18.66	18.23	17.81	Semidiameter . .	17.48	17.10	16 79	16.53	16.29
Horizontal Parallax	1.74	1.70	1.66	Hor. Parallax . .	1.63	1.59	1.57	1.54	1.52

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign − indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

	JANUARY.						FEBRUARY.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	19 16 52.63	+ 1.261	− 22 06 03.7	+ 2.13	0 35.9	1	19 32 23.47	+ 1.208	− 21 36 55.3	+ 2.49	22 46.1
2	19 17 22.91	1.262	22 05 12.4	2.15	0 32.5	2	19 32 52.41	1.203	21 35 55.5	2.50	22 42.6
3	19 17 53.22	1.264	22 04 20.6	2.17	0 29.1	3	19 33 21.23	1.198	21 34 55.6	2.50	22 39.2
4	19 18 23.56	1.265	22 03 28.4	2.19	0 25.7	4	19 33 49.93	1.193	21 33 55.6	2.50	22 35.7
5	19 18 53.92	1.266	22 02 35.7	2.21	0 22.3	5	19 34 18.51	1.188	21 32 55.6	2.50	22 32.3
6	19 19 24.30	+ 1.266	− 22 01 42.6	+ 2.23	0 18.9	6	19 34 46.95	+ 1.182	− 21 31 55.6	+ 2.50	22 28.8
7	19 19 54.70	1.267	22 00 49.1	2.24	0 15.5	7	19 35 15.24	1.176	21 30 55.6	2.50	22 25.3
8	19 20 25.11	1.267	21 59 55.3	2.25	0 12.0	8	19 35 43.38	1.170	21 29 55.6	2.50	22 21.8
9	19 20 55.52	1.267	21 59 01.1	2.27	0 08.6	9	19 36 11.38	1.164	21 28 55.6	2.49	22 18.4
10	19 21 25.92	1.266	21 58 06.5	2.28	0 05.2	10	19 36 39.23	1.157	21 27 55.7	2.49	22 14.9
11	19 21 56.31	+ 1.266	− 21 57 11.5	+ 2.30	{0 01.5 / 23 58.3}	11	19 37 06.91	+ 1.150	− 21 26 55.9	+ 2.49	22 11.4
12	19 22 26.69	1.265	21 56 16.2	2.31	23 54.9	12	19 37 34.42	1.143	21 25 56.2	2.49	22 07.9
13	19 22 57.05	1.264	21 55 20.6	2.32	23 51.5	13	19 38 01.77	1.136	21 24 56.5	2.48	22 04.5
14	19 23 27.38	1.263	21 54 24.7	2.34	23 48.1	14	19 38 28.94	1.129	21 23 57.0	2.48	22 01.0
15	19 23 57.68	1.262	21 53 28.4	2.35	23 44.6	15	19 38 55.93	1.121	21 22 57.6	2.47	21 57.5
16	19 24 27.95	+ 1.261	− 21 52 31.8	+ 2.36	23 41.2	16	19 39 22.73	+ 1.113	− 21 21 58.3	+ 2.47	21 54.0
17	19 24 58.18	1.259	21 51 34.9	2.37	23 37.7	17	19 39 49.35	1.105	21 20 59.1	2.46	21 50.5
18	19 25 28.36	1.257	21 50 37.8	2.38	23 34.3	18	19 40 15.78	1.097	21 20 00.2	2.45	21 47.0
19	19 25 58.48	1.255	21 49 40.4	2.39	23 30.8	19	19 40 42.01	1.089	21 19 01.5	2.44	21 43.5
20	19 26 28.55	1.253	21 48 42.8	2.40	23 27.4	20	19 41 08.04	1.081	21 18 03.0	2.43	21 40.0
21	19 26 58.55	+ 1.250	− 21 47 44.9	+ 2.41	23 24.0	21	19 41 33.86	+ 1.072	− 21 17 04.6	+ 2.42	21 36.5
22	19 27 28.49	1.247	21 46 46.8	2.42	23 20.6	22	19 41 59.49	1.063	21 16 06.5	2.41	21 33.0
23	19 27 58.37	1.244	21 45 48.4	2.43	23 17.1	23	19 42 24.90	1.054	21 15 08.7	2.40	21 29.5
24	19 28 28.19	1.241	21 44 49.8	2.44	23 13.7	24	19 42 50.09	1.045	21 14 11.2	2.39	21 26.0
25	19 28 57.92	1.238	21 43 51.1	2.45	23 10.2	25	19 43 15.05	1.036	21 13 13.9	2.37	21 22.5
26	19 29 27.56	+ 1.234	− 21 42 52.2	+ 2.46	23 06.8	26	19 43 39.80	+ 1.026	− 21 12 17.0	+ 2.36	21 19.0
27	19 29 57.12	1.230	21 41 53.1	2.47	23 03.3	27	19 44 04.31	1.016	21 11 20.4	2.34	21 15.5
28	19 30 26.59	1.226	21 40 53.7	2.48	22 59.9	28	19 44 28.59	1.006	21 10 24.1	2.33	21 11.9
29	19 30 55.96	1.222	21 39 54.3	2.48	22 56.4	29	19 44 52.64	0.996	21 09 28.2	2.32	21 08.4
30	19 31 25.23	1.218	21 38 54.8	2.49	22 53.0	30	19 45 16.44	0.986	21 08 32.7	2.30	21 04.8
31	19 31 54.40	+ 1.213	− 21 37 55.1	+ 2.49	22 49.5	31	19 45 40.00	+ 0.976	− 21 07 37.6	+ 2.29	21 01.3
32	19 32 23.47	+ 1.208	− 21 36 55.3	+ 2.49	22 46.1	32	19 46 03.31	+ 0.966	− 21 06 42.9	+ 2.27	20 57.7

Day of the Month.	0.	8th.	16th.	24th.	Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″		″	″	″	″
Semidiameter	7.10	7.10	7.10	7.11	Semidiameter	7.13	7.16	7.21	7.26
Horizontal Parallax . .	0.80	0.81	0.81	0.81	Horizontal Parallax . .	0.81	0.81	0.81	0.82

Note.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 44 52.64	+0.996	−21 09 28.2	+2.32	21 08.4
2	19 45 16.44	0.986	21 08 32.7	2.30	21 04.8
3	19 45 40.00	0.976	21 07 37.6	2.29	21 01.3
4	19 46 03.31	0.966	21 06 42.9	2.27	20 57.7
5	19 46 26.37	0.955	21 05 48.6	2.25	20 54.2
6	19 46 49.16	+0.944	−21 04 54.8	+2.23	20 50.6
7	19 47 11.69	0.933	21 04 01.5	2.21	20 47.1
8	19 47 33.95	0.922	21 03 08.7	2.19	20 43.5
9	19 47 55.94	0.910	21 02 16.4	2.17	20 40.0
10	19 48 17.65	0.898	21 01 24.6	2.15	20 36.4
11	19 48 39.08	+0.886	−21 00 33.4	+2.13	20 32.8
12	19 49 00.22	0.874	20 59 42.8	2.11	20 29.2
13	19 49 21.08	0.862	20 58 52.7	2.08	20 25.6
14	19 49 41.64	0.850	20 58 03.3	2.05	20 22.0
15	19 50 01.90	0.838	20 57 14.5	2.03	20 18.4
16	19 50 21.86	+0.826	− 20 56 26.3	+2.00	20 14.8
17	19 50 41.52	0.813	20 55 38.7	1.97	20 11.2
18	19 51 00.87	0.800	20 54 51.9	1.94	20 07.6
19	19 51 19.91	0.787	20 54 05.7	1.91	20 04.0
20	19 51 38.63	0.774	20 53 20.2	1.88	20 00.3
21	19 51 57.04	+0.761	−20 52 35.4	+1.85	19 56.7
22	19 52 15.13	0.748	20 51 51.3	1.82	19 53.0
23	19 52 32.89	0.734	20 51 08.0	1.79	19 49.4
24	19 52 50.33	0.720	20 50 25.5	1.76	19 45.7
25	19 53 07.44	0.706	20 49 43.7	1.73	19 42.1
26	19 53 24.22	+0.692	− 20 49 02.7	+1.70	19 38.4
27	19 53 40.66	0.678	20 48 22.5	1.67	19 34.8
28	19 53 56.76	0.664	20 47 43.2	1.63	19 31.1
29	19 54 12.52	0.649	20 47 04.7	1.59	19 27.5
30	19 54 27.93	0.635	20 46 27.1	1.56	19 23.8
31	19 54 42.99	+0.621	−20 45 50.3	+1.52	19 20.1
32	19 54 57.70	+0.606	−20 45 14.4	+1.48	19 16.4

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. oon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 54 57.70	+0.606	−20 45 14.4	+1.48	19 16.4
2	19 55 12.06	0.591	20 44 39.4	1.44	19 12.7
3	19 55 26.06	0.576	20 44 05.4	1.40	19 09.0
4	19 55 39.69	0.561	20 43 32.3	1.36	19 05.3
5	19 55 52.96	0.546	20 43 00.1	1.32	19 01.5
6	19 56 05.86	+0.530	−20 42 28.8	+1.28	18 57.8
7	19 56 18.39	0.514	20 41 58.5	1.24	18 54.1
8	19 56 30.54	0.498	20 41 29.3	1.20	18 50.4
9	19 56 42.31	0.483	20 41 01.1	1.16	18 46.6
10	19 56 53.70	0.467	20 40 33.9	1.12	18 42.8
11	19 57 04.71	+0.451	−20 40 07.7	+1.07	18 39.1
12	19 57 15.34	0.435	20 39 42.6	1.03	18 35.3
13	19 57 25.58	0.419	20 39 18.6	0.98	18 31.6
14	19 57 35.44	0.403	20 38 55.6	0.94	18 27.8
15	19 57 44.90	0.387	20 38 33.6	0.90	18 24.0
16	19 57 53.97	+0.371	−20 38 12.7	+0.85	18 20.2
17	19 58 02.65	0.354	20 37 52.9	0.81	18 16.4
18	19 58 10.93	0.337	20 37 34.2	0.76	18 12.6
19	19 58 18.82	0.321	20 37 16.5	0.72	18 08.8
20	19 58 26.31	0.304	20 36 59.9	0.67	18 05.0
21	19 58 33.40	+0.288	−20 36 44.5	+0.62	18 01.2
22	19 58 40.09	0.271	20 36 30.2	0.57	17 57.4
23	19 58 46.38	0.254	20 36 17.0	0.52	17 53.5
24	19 58 52.27	0.238	20 36 05.0	0.47	17 49.7
25	19 58 57.76	0.221	20 35 54.1	0.43	17 45.8
26	19 59 02.86	+0.204	−20 35 44.3	+0.38	17 42.0
27	19 59 07.54	0.187	20 35 35.7	0.34	17 38.1
28	19 59 11.82	0.170	20 35 28.3	0.29	17 34.3
29	19 59 15.69	0.153	20 35 22.0	0.24	17 30.4
30	19 59 19.15	0.136	20 35 16.9	0.19	17 26.5
31	19 59 22.20	+0.119	−20 35 13.0	+0.14	17 22.6
32	19 59 24.84	+0.102	−20 35 10.3	+0.09	17 18.7

Day of the Month.	5th.	13th.	21st.	29th.
	″	″	″	″
Semidiameter	7.33	7.41	7.50	7.59
Horizontal Parallax . .	0.83	0.84	0.84	0.85

Day of the Month.	6th.	14th.	22d.	30th.
	″	″	″	″
Semidiameter	7.68	7.78	7.89	7.99
Horizontal Parallax . .	0.86	0.88	0.89	0.90

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

SATURN, 1902.

GREENWICH MEAN TIME.

		MAY.						JUNE.			
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	19 59 22.20	+0.119	−20 35 13.0	+0.14	17 22.6	1	19 57 36.91	−0.389	−20 42 44.6	−1.31	15 18.9
2	19 59 24.84	0.102	20 35 10.3	0.09	17 18.7	2	19 57 27.39	0.404	20 43 16.4	1.35	15 14.9
3	19 59 27.07	0.085	20 35 08.7	+0.04	17 14.8	3	19 57 17.52	0.419	20 43 49.2	1.39	15 10.7
4	19 59 28.90	0.067	20 35 08.3	−0.01	17 10.9	4	19 57 07.30	0.433	20 44 22.9	1.43	15 06.6
5	19 59 30.30	0.050	20 35 09.1	0.06	17 07.0	5	19 56 56.74	0.447	20 44 57.6	1.47	15 02.5
6	19 59 31.29	+0.033	−20 35 11.1	−0.11	17 03.1	6	19 56 45.83	−0.461	−20 45 33.2	−1.51	14 58.3
7	19 59 31.88	+0.016	20 35 14.3	0.16	16 59.2	7	19 56 34.60	0.475	20 46 09.6	1.54	14 54.2
8	19 59 32.06	−0.001	20 35 18.7	0.21	16 55.2	8	19 56 23.05	0.488	20 46 46.9	1.58	14 50.1
9	19 59 31.82	0.018	20 35 24.3	0.26	16 51.3	9	19 56 11.19	0.501	20 47 25.1	1.62	14 46.0
10	19 59 31.17	0.035	20 35 31.1	0.31	16 47.3	10	19 55 59.00	0.514	20 48 04.0	1.65	14 41.8
11	19 59 30.11	−0.052	−20 35 39.0	−0.36	16 43.4	11	19 55 46.51	−0.527	−20 48 43.7	−1.68	14 37.7
12	19 59 28.64	0.069	20 35 48.1	0.41	16 39.4	12	19 55 33.72	0.539	20 49 24.2	1.71	14 33.5
13	19 59 26.77	0.086	20 35 58.3	0.45	16 35.4	13	19 55 20.63	0.551	20 50 05.6	1.74	14 29.4
14	19 59 24.50	0.103	20 36 09.7	0.50	16 31.5	14	19 55 07.26	0.563	20 50 47.6	1.77	14 25.2
15	19 59 21.82	0.120	20 36 22.3	0.55	16 27.5	15	19 54 53.61	0.575	20 51 30.3	1.80	14 21.1
16	19 59 18.74	−0.137	−20 36 36.0	−0.60	16 23.5	16	19 54 39.68	−0.587	−20 52 13.7	−1.83	14 16.9
17	19 59 15.26	0.153	20 36 50.8	.0.65	16 19.5	17	19 54 25.46	0.598	20 52 57.8	1.85	14 12.7
18	19 59 11.39	0.169	20 37 06.8	0.69	16 15.5	18	19 54 10.99	0.609	20 53 42.5	1.88	14 08.6
19	19 59 07.13	0.186	20 37 23.9	0.74	16 11.5	19	19 53 56.27	0.619	20 54 27.8	1.91	14 04.4
20	19 59 02.47	0.202	20 37 42.1	0.79	16 07.5	20	19 53 41.30	0.629	20 55 13.7	1.93	14 00.2
21	19 58 57.42	−0.218	−20 38 01.4	−0.83	16 03.5	21	19 53 26.09	−0.639	−20 56 00.2	−1.95	13 56.0
22	19 58 51.99	0.234	20 38 21.8	0.88	15 59.5	22	19 53 10.64	0.648	20 56 47.3	1.97	13 51.8
23	19 58 46.17	0.250	20 38 43.3	0.92	15 55.4	23	19 52 54.97	0.657	20 57 34.9	1.99	13 47.6
24	19 58 39.97	0.266	20 39 06.0	0.97	15 51.4	24	19 52 39.08	0.666	20 58 22.9	2.01	13 43.4
25	19 58 33.39	0.282	20 39 29.6	1.02	15 47.3	25	19 52 22.96	0.675	20 59 11.4	2.03	13 39.2
26	19 58 26.43	−0.298	−20 39 54.3	−1.06	15 43.3	26	19 52 06.64	−0.684	−21 00 00.4	−2.05	13 35.0
27	19 58 19.10	0.314	20 40 20.1	1.10	15 39.2	27	19 51 50.13	0.692	21 00 49.8	2.07	13 30.8
28	19 58 11.39	0.329	20 40 47.1	1.14	15 35.2	28	19 51 33.42	0.700	21 01 39.6	2.09	13 26.6
29	19 58 03.31	0.344	20 41 15.0	1.19	15 31.1	29	19 51 16.52	0.707	21 02 29.8	2.10	13 22.4
30	19 57 54.87	0.359	20 41 43.9	1.23	15 27.0	30	19 50 59.45	0.714	21 03 20.4	2.12	13 18.1
31	19 57 46.07	−0.374	−20 42 13.8	−1.27	15 23.0	31	19 50 42.21	−0.721	−21 04 11.3	−2.13	13 13.9
32	19 57 36.91	−0.389	−20 42 44.6	−1.31	15 18.9	32	19 50 24.81	−0.728	−21 05 02.5	−2.14	13 09.7

Day of the Month.	8th.	16th.	24th.	Day of the Month.	1st.	9th.	17th.	25th.
	"	"	"		"	"	"	"
Semidiameter	8.09	8.20	8 30	Semidiameter	8.39	8.47	8.55	8.61
Horizontal Parallax	0.92	0.93	0.94	Horizontal Parallax . .	0.95	0.96	0.97	0.97

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

	JULY.						AUGUST.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	19 50 42.21	−0.721	−21 04 11.3	−2.13	13 13.9	1	19 41 15.49	−0.740	−21 30 46.1	−2.00	11 02.7
2	19 50 24.81	0.728	21 05 02.5	2.14	13 09.7	2	19 40 57.79	0.734	21 31 33.8	1.98	10 58.4
3	19 50 07.27	0.734	21 05 54.0	2.15	13 05.5	3	19 40 40.24	0.728	21 32 21.1	1.96	10 54.2
4	19 49 49.58	0.740	21 06 45.7	2.16	13 01.3	4	19 40 22.84	0.721	21 33 07.9	1.94	10 50.0
5	19 49 31.76	0.745	21 07 37.6	2.17	12 57.0	5	19 40 05.59	0.714	21 33 54.1	1.92	10 45.8
6	19 49 13.82	−0.750	−21 08 29.7	−2.17	12 52.8	6	19 39 48.52	−0.707	−21 34 39.8	−1.89	10 41.6
7	19 48 55.77	0.754	21 09 22.1	2.18	12 48.6	7	19 39 31.63	0.699	21 35 25.0	1.87	10 37.4
8	19 48 37.61	0.758	21 10 14.5	2.18	12 44.4	8	19 39 14.93	0.691	21 36 09.6	1.85	10 33.2
9	19 48 19.36	0.762	21 11 07.0	2.18	12 40.1	9	19 38 58.42	0.683	21 36 53.6	1.82	10 29.0
10	19 48 01.03	0.765	21 11 59.6	2.18	12 35.9	10	19 38 42.11	0.675	21 37 37.0	1.80	10 24.8
11	19 47 42.63	−0.768	−21 12 52.2	−2.19	12 31.6	11	19 38 26.01	−0.666	−21 38 19.7	−1.77	10 20.6
12	19 47 24.16	0.771	21 13 44.9	2.19	12 27.4	12	19 38 10.12	0.657	21 39 01.8	1.75	10 16.4
13	19 47 05.64	0.773	21 14 37.5	2.19	12 23.2	13	19 37 54.46	0.647	21 39 43.3	1.72	10 12.2
14	19 46 47.07	0.775	21 15 30.1	2.19	12 18.9	14	19 37 39.04	0.637	21 40 24.1	1.69	10 08.0
15	19 46 28.46	0.776	21 16 22.7	2.18	12 14.7	15	19 37 23.87	0.627	21 41 04.2	1.66	10 03.8
16	19 46 09.81	−0.777	−21 17 15.2	−2.18	12 10.4	16	19 37 08.94	−0.617	−21 41 43.7	−1.63	9 59.6
17	19 45 51.16	0.777	21 18 07.6	2.18	12 06.2	17	19 36 54.27	0.606	21 42 22.5	1.60	9 55.5
18	19 45 32.51	0.776	21 18 59.9	2.17	12 01.9	18	19 36 39.87	0.595	21 43 00.5	1.57	9 51.3
19	19 45 13.86	0.776	21 19 52.0	2.17	11 57.7	19	19 36 25.73	0.584	21 43 37.8	1.54	9 47.1
20	19 44 55.21	0.775	21 20 43.9	2.16	11 53.5	20	19 36 11.86	0.572	21 44 14.4	1.51	9 43.0
21	19 44 36.58	−0.775	−21 21 35.6	−2.15	11 49.2	21	19 35 58.28	−0.560	−21 44 50.3	−1.48	9 38.8
22	19 44 17.98	0.774	21 22 27.2	2.14	11 45.0	22	19 35 44.99	0.548	21 45 25.4	1.45	9 34.7
23	19 43 59.41	0.772	21 23 18.6	2.13	11 40.8	23	19 35 31.99	0.535	21 45 59.7	1.42	9 30.5
24	19 43 40.90	0.770	21 24 09.6	2.12	11 36.5	24	19 35 19.29	0.522	21 46 33.2	1.39	9 26.4
25	19 43 22.44	0.768	21 25 00.3	2.11	11 32.3	25	19 35 06.90	0.509	21 47 06.0	1.36	9 22.2
26	19 43 04.04	−0.765	−21 25 50.8	−2.10	11 28.0	26	19 34 54.83	−0.496	−21 47 38.0	−1.32	9 18.1
27	19 42 45.71	0.762	21 26 41.0	2.08	11 23.8	27	19 34 43.08	0.482	21 48 09.2	1.29	9 14.0
28	19 42 27.46	0.758	21 27 30.8	2.07	11 19.6	28	19 34 31.66	0.468	21 48 39.6	1.25	9 09.9
29	19 42 09.31	0.754	21 28 20.2	2.05	11 15.3	29	19 34 20.57	0.454	21 49 09.1	1.22	9 05.7
30	19 41 51.26	0.750	21 29 09.2	2.04	11 11.1	30	19 34 09.82	0.440	21 49 37.8	1.18	9 01.6
31	19 41 33.32	−0.745	−21 29 57.9	−2.02	11 06.9	31	19 33 59.42	−0.426	−21 50 05.6	−1.14	8 57.5
32	19 41 15.49	−0.740	−21 30 46.1	−2.00	11 02.7	32	19 33 49.36	−0.411	−21 50 32.6	−1.11	8 53.4

Day of the Month.	3d.	11th.	19th.	27th.	Day of the Month.	4th.	12th.	20th.	28th.
	″	″	″	″		″	″	″	″
Semidiameter	8.65	8.67	8.67	8.67	Semidiameter	8.65	8.59	8.53	8.45
Horizontal Parallax . .	0.98	0.98	0.98	0.98	Horizontal Parallax . .	0.97	0.97	0.96	0.95

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign − indicates that north declinations are decreasing or south declinations increasing.

SATURN, 1902.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 33 49.36	−0.411	−21 50 32.6	−1.11	8 53.4
2	19 33 39.66	0.396	21 50 58.7	1.07	8 49.3
3	19 33 30.32	0.381	21 51 24.0	1.04	8 45.3
4	19 33 21.35	0.366	21 51 48.4	1.00	8 41.2
5	19 33 12.75	0.351	21 52 11.9	0.96	8 37.1
6	19 33 04.52	−0.335	−21 52 34.5	−0.93	8 33.1
7	19 32 56.68	0.319	21 52 56.2	0.89	8 29.0
8	19 32 49.22	0.303	21 53 17.0	0.85	8 24.9
9	19 32 42.14	0.287	21 53 37.0	0.81	8 20.9
10	19 32 35.46	0.270	21 53 56.0	0.77	8 16.8
11	19 32 29.17	−0.254	−21 54 14.1	−0.74	8 12.8
12	19 32 23.27	0.237	21 54 31.4	0.70	8 08.8
13	19 32 17.76	0.220	21 54 47.8	0.66	8 04.7
14	19 32 12.66	0.204	21 55 03.2	0.62	8 00.7
15	19 32 07.97	0.187	21 55 17.7	0.58	7 56.7
16	19 32 03.68	−0.170	−21 55 31.3	−0.55	7 52.7
17	19 31 59.79	0.153	21 55 44.0	0.51	7 48.7
18	19 31 56.31	0.136	21 55 55.8	0.47	7 44.7
19	19 31 53.24	0.119	21 56 06.6	0.43	7 40.8
20	19 31 50.58	0.102	21 56 16.5	0.39	7 36.8
21	19 31 48.34	−0.085	−21 56 25.5	−0.36	7 32.8
22	19 31 46.51	0.068	21 56 33.5	0.32	7 28.9
23	19 31 45.10	0.050	21 56 40.6	0.28	7 24.9
24	19 31 44.11	0.033	21 56 46.8	0.24	7 21.0
25	19 31 43.54	·0.015	21 56 52.1	0.20	7 17.0
26	19 31 43.39	+0.002	21 56 56.4	−0.16	7 13.1
27	19 31 43.66	0.020	21 56 59.8	0.12	7 09.2
28	19 31 44.35	0.037	21 57 02.2	0.08	7 05.3
29	19 31 45.47	0.055	21 57 03.7	−0.04	7 01.4
30	19 31 47.02	0.073	21 57 04.2	0.00	6 57.5
31	19 31 48.99	+0.091	−21 57 03.7	+0.04	6 53.6
32	19 31 51.38	+0.109	−21 57 02.3	+0.08	6 49.7

OCTOBER.

Day of Month	Apparent Right Ascension. Noon	Var of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 31 48.99	+0.091	−21 57 03.7	+0.04	6 53.6
2	19 31 51.38	0.109	21 57 02.3	0.08	6 49.7
3	19 31 54.20	0.127	21 57 00.0	0.12	6 45.8
4	19 31 57.46	0.145	21 56 56.7	0.16	6 41.9
5	19 32 01.14	0.162	21 56 52.4	0.20	6 38.0
6	19 32 05.24	+0.180	−21 56 47.2	+0.24	6 34.2
7	19 32 09.75	0.198	21 56 41.1	0.28	6 30.3
8	19 32 14.70	0.215	21 56 34.0	0.31	6 26.5
9	19 32 20.07	0.233	21 56 25.9	0.35	6 22.7
10	19 32 25.85	0.250	21 56 16.9	0.39	6 18.8
11	19 32 32.05	+0.268	−21 56 07.0	+0.43	6 15.0
12	19 32 38.67	0.285	21 55 56.1	0.47	6 11.1
13	19 32 45.70	0.302	21 55 44.3	0.51	6 07.3
14	19 32 53.14	0.319	21 55 31.5	0.55	6 03.5
15	19 33 01.00	0.336	21 55 17.8	0.59	5 59.7
16	19 33 09.26	+0.353	−21 55 03.1	+0.63	5 55.9
17	19 33 17.93	0.370	21 54 47.5	0.67	5 52.1
18	19 33 27.00	0.387	21 54 31.0	0.71	5 48.3
19	19 33 36.47	0.404	21 54 13.6	0.75	5 44.6
20	19 33 46.35	0.420	21 53 55.2	0.79	5 40.8
21	19 33 56.62	+0.437	−21 53 35.8	+0.83	5 37.1
22	19 34 07.29	0.453	21 53 15.5	0.87	5 33.3
23	19 34 18.35	0.469	21 52 54.3	0.91	5 29.6
24	19 34 29.80	0.485	21 52 32.1	0.94	5 25.8
25	19 34 41.64	0.501	21 52 09.0	0.98	5 22.1
26	19 34 53.87	+0.517	−21 51 44.9	+1.02	5 18.3
27	19 35 06.49	0.533	21 51 19.9	1.06	5 14.6
28	19 35 19.49	0.549	21 50 53.9	1.10	5 10.9
29	19 35 32.87	0.565	21 50 27.0	1.14	5 07.2
30	19 35 46.62	0.581	21 49 59.2	1.18	5 03.5
31	19 36 00.75	+0.597	−21 49 30.5	+1.22	4 59.8
32	19 36 15.26	+0.612	−21 49 00.8	+1.26	4 56.1

Day of the Month.	5th.	18th.	21st.	29th.
	″	″	″	″
Semidiameter	8.36	8.26	8.17	8.06
Horizontal Parallax . .	0.94	0.93	0.92	0.91

Day of the Month.	7th.	15th.	23d.	31st.
	″	″	″	″
Semidiameter	7.96	7.85	7.75	7.66
Horizontal Parallax . .	0.90	0.88	0.87	0.86

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 36 15.26	+0.612	−21 49 00.8	+1.26	4 56.1
2	19 36 30.13	0.627	21 48 30.2	1.30	4 52.4
3	19 36 45.36	0.642	21 47 58.6	1.34	4 48.7
4	19 37 00.94	0.657	21 47 26.1	1.37	4 45.1
5	19 37 16.89	0.672	21 46 52.7	1.41	4 41.4
6	19 37 33.19	+0.687	−21 46 18.4	+1.45	4 37.8
7	19 37 49.83	0.701	21 45 43.2	1.49	4 34.1
8	19 38 06.82	0.715	21 45 07.1	1.53	4 30.5
9	19 38 24.15	0.729	21 44 30.0	1.56	4 26.8
10	19 38 41.81	0.743	21 43 52.1	1.60	4 23.2
11	19 38 59.80	+0.757	−21 43 13.3	+1.64	4 19.5
12	19 39 18.12	0.770	21 42 33.6	1.68	4 15.9
13	19 39 36.76	0.783	21 41 53.0	1.72	4 12.3
14	19 39 55.72	0.796	21 41 11.5	1.75	4 08.7
15	19 40 14.99	0.809	21 40 29.1	1.79	4 05.1
16	19 40 34.58	+0.822	−21 39 45.8	+1.83	4 01.5
17	19 40 54.47	0.835	21 39 01.6	1.86	3 57.9
18	19 41 14.66	0.848	21 38 16.5	1.90	3 54.3
19	19 41 35.15	0.860	21 37 30.5	1.93	3 50.7
20	19 41 55.94	0.872	21 36 43.7	1.97	3 47.1
21	19 42 17.02	+0.884	−21 35 56.0	+2.01	3 43.5
22	19 42 38.38	0.896	21 35 07.4	2.04	3 39.9
23	19 43 00.03	0.908	21 34 17.9	2.08	3 36.3
24	19 43 21.96	0.920	21 33 27.6	2.11	3 32.8
25	19 43 44.17	0.931	21 32 36.4	2.15	3 29.2
26	19 44 06.64	+0.942	−21 31 44.4	+2.19	3 25.7
27	19 44 29.38	0.953	21 30 51.5	2.22	3 22.1
28	19 44 52.38	0.964	21 29 57.7	2.26	3 18.6
29	19 45 15.64	0.974	21 29 03.1	2.29	3 15.0
30	19 45 39.15	0.984	21 28 07.7	2.33	3 11.5
31	19 46 02.91	+0.994	−21 27 11.5	+2.37	3 07.9
32	19 46 26.91	+1.004	−21 26 14.4	+2.40	3 04.4

DECEMBER.

Day of Month	Apparent Right Ascension. Noon.	Var. of R.A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 46 02.91	+0.994	−21 27 11.5	+2.37	3 07.9
2	19 46 26.91	1.004	21 26 14.4	2.40	3 04.4
3	19 46 51.16	1.014	21 25 16.5	2.43	3 00.8
4	19 47 15.63	1.024	21 24 17.8	2.46	2 57.3
5	19 47 40.32	.1.033	21 23 18.3	2.50	2 53.8
6	19 48 05.23	+1.042	−21 22 18.0	+2.53	2 50.3
7	19 48 30.37	1.051	21 21 16.9	2.56	2 46.8
8	19 48 55.71	1.060	21 20 15.0	2.59	2 43.3
9	19 49 21.26	1.069	21 19 12.4	2.62	2 39.8
10	19 49 47.01	1.077	21 18 09.0	2.66	2 36.3
11	19 50 12.96	+1.085	−21 17 04.8	+2.69	2 32.8
12	19 50 39.10	1.093	21 15 59.9	2.72	2 29.3
13	19 51 05.42	1.101	21 14 54.2	2.75	2 25.8
14	19 51 31.93	1.108	21 13 47.8	2.78	2 22.3
15	19 51 58.62	1.115	21 12 40.7	2.81	2 18.8
16	19 52 25.47	+1.122	−21 11 32.8	+2.84	2 15.3
17	19 52 52.49	1.129	21 10 24.2	2.87	2 11.8
18	19 53 19.68	1.136	21 09 14.9	2.90	2 08.4
19	19 53 47.03	1.143	21 08 04.9	2.93	2 04.9
20	19 54 14.53	1.149	21 06 54.2	2.96	2 01.4
21	19 54 42.18	+1.155	−21 05 42.8	+2.99	1 57.9
22	19 55 09.98	1.161	21 04 30.7	3.02	1 54.5
23	19 55 37.92	1.167	21 03 18.0	3.05	1 51.0
24	19 56 05.99	1.172	21 02 04.6	3.07	1 47.5
25	19 56 34.20	1.177	21 00 50.5	3.10	1 44.0
26	19 57 02.54	+1.182	−20 59 35.8	+3.12	1 40.6
27	19 57 30.99	1.187	20 58 20.5	3.15	1 37.1
28	19 57 59.56	1.192	20 57 04.6	3.17	1 33.7
29	19 58 28.24	1.197	20 55 48.0	3.20	1 30.2
30	19 58 57.03	1.201	20 54 30.8	3.23	1 26.8
31	19 59 25.92	+1.205	−20 53 13.0	+3.26	1 23.3
32	19 59 54.90	+1.209	−20 51 54.7	+3.28	1 19.9

Day of the Month.	8th.	16th.	24th.
Semidiameter	7.55	7.47	7.40
Horizontal Parallax	0.85	0.84	0.83

Day of the Month.	2d.	10th.	18th.	26th.	34th.
Semidiameter . .	7.33	7.26	7.21	7.18	7.14
Hor. Parallax . .	0.82	0.82	0.81	0.81	0.80

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign − indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.	Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 0	17 09 34.73	+ 15.090	- 22 59 34.6	- 18.75	22 29.2	July 3	17 09 32.99	- 9.587	- 23 01 40.8	+ 11.04	10 25.5
4	17 10 34.50	14.786	23 00 48.2	18.04	22 14.5	7	17 08 55.44	9.174	23 00 57.3	10.70	10 09.1
8	17 11 32.95	14.431	23 01 59.0	17.31	21 59.7	11	17 08 19.68	8.697	23 00 15.3	10.28	9 52.8
12	17 12 29.87	14.020	23 03 06.7	16.54	21 44.9	15	17 07 45.94	8.164	22 59 35.2	9.74	9 36.5
16	17 13 25.04	13.559	23 04 11.3	15.72	21 30.1	19	17 07 14.43	7.584	22 58 57.5	9.11	9 20.3
20	17 14 18.28	+ 13.052	- 23 05 12.5	- 14.90	21 15.3	23	17 06 45.33	- 6.957	- 22 58 22.4	+ 8.42	9 04.1
24	17 15 09.40	12.502	23 06 10.5	14.07	21 00.4	27	17 06 18.83	6.287	22 57 50.2	7.66	8 47.9
28	17 15 58.24	11.911	23 07 05.1	13.21	20 45.5	31	17 05 55.09	5.573	22 57 21.2	6.81	8 31.8
Feb. 1	17 16 44 63	11.276	23 07 56.2	12.35	20 30.5	Aug. 4	17 05 34.30	4.817	22 56 55.8	5.69	8 15.7
5	17 17 28.39	10.597	23 08 43.9	11.47	20 15.5	8	17 05 16.60	4.030	22 56 34.2	4.91	7 59.7
9	17 18 09.35	+ 9.876	- 23 09 28.0	- 10.59	20 00.4	12	17 05 02.12	- 3.210	- 22 56 16.6	+ 3.87	7 43.7
13	17 18 47.35	9.117	23 10 08.6	9.71	19 45.3	16	17 04 50.95	2.373	22 56 03.3	2.78	7 27.8
17	17 19 22.25	8.329	23 10 45.7	8.84	19 30.2	20	17 04 43.16	1.520	22 55 54.4	1.66	7 12.0
21	17 19 53.95	7.518	23 11 19.3	7.95	19 15.0	24	17 04 38.81	- 0.652	22 55 50.0	+ 0.54	6 56.2
25	17 20 22.36	6.683	23 11 49.3	7.07	18 59.7	28	17 04 37.96	+ 0.228	22 55 50.1	0.60	6 40.5
Mar. 1	17 20 47.38	+ 5.823	- 23 12 15.9	- 6.21	18 44.4	Sept. 1	17 04 40.65	+ 1.119	- 22 55 54.8	- 1.76	6 24.8
5	17 21 08.91	4.938	23 12 39.0	5.35	18 29.0	5	17 04 46.92	2.014	22 56 04.2	2.94	6 09.2
9	17 21 26.86	4.036	23 12 58.7	4.50	18 13.5	9	17 04 56.76	2.905	22 56 18.3	4.10	5 53.6
13	17 21 41.18	3.122	23 13 15.0	3.64	17 58.0	13	17 05 10.15	3.787	22 56 37.0	5.24	5 38.1
17	17 21 51.83	2.203	23 13 27.8	2.79	17 42.5	17	17 05 27.04	4.655	22 57 00.2	6.34	5 22.6
21	17 21 58.81	+ 1.287	- 23 13 37.3	- 1.96	17 26.9	21	17 05 47.38	+ 5.512	- 22 57 27.7	- 7.41	5 07.2
25	17 22 02.13	+ 0.374	23 13 43.5	1.12	17 11.2	25	17 06 11.12	6.355	22 57 59.4	8.43	4 51.9
29	17 22 01.81	- 0.532	23 13 46.3	- 0.29	16 55.4	29	17 06 38.21	7.183	22 58 35.1	9.42	4 36.6
Apr. 2	17 21 57.88	1.432	23 13 45.8	+ 0.52	16 39.6	Oct. 3	17 07 08.57	7.990	22 59 14.7	10.36	4 21.4
6	17 21 50.37	2.321	23 13 42.1	1.31	16 23.7	7	17 07 42.09	8.765	22 59 57.9	11.22	4 06.2
10	17 21 39.34	- 3.189	- 23 13 35.2	+ 2.12	16 07.8	11	17 08 18.65	+ 9.511	- 23 00 44.4	- 12.02	3 51.1
14	17 21 24.90	4.026	23 13 25.1	2.94	15 51.8	15	17 08 58.13	10.222	23 01 34.0	12.75	3 36.1
18	17 21 07.18	4.829	23 13 11.7	3.74	15 35.8	19	17 09 40.38	10.900	23 02 26.3	13.40	3 21.1
22	17 20 46.32	5.595	23 12 55.3	4.49	15 19.7	23	17 10 25.28	11.544	23 03 21.1	13.97	3 06.1
26	17 20 22.48	6.320	23 12 35.8	5.24	15 03.6	27	17 11 12.69	12.157	23 04 18.0	14.46	2 51.1
30	17 19 55.81	- 7.009	- 23 12 13.4	+ 5.96	14 47.4	31	17 12 02.48	+ 12.729	- 23 05 16.7	- 14.89	2 36.2
May 4	17 19 26.47	7.653	23 11 48.1	6.67	14 31.2	Nov. 4	17 12 54.46	13.254	23 06 17.0	15.24	2 21.4
8	17 18 54.66	8.242	23 11 20.0	7.36	14 15.0	8	17 13 48.45	13.733	23 07 18.5	15.49	2 06.5
12	17 18 20.61	8.772	23 10 49.2	8.00	13 58.7	12	17 14 44.26	14.162	23 08 20.8	15.66	1 51.7
16	17 17 44.57	9.237	23 10 16.0	8.61	13 42.4	16	17 15 41.69	14.547	23 09 23.7	15.78	1 37.0
20	17 17 06.80	- 9.640	- 23 09 40.3	+ 9.19	13 26.0	20	17 16 40.58	+ 14.889	- 23 10 26.9	- 15.81	1 22.2
24	17 16 27.54	9.980	23 09 02.5	9.71	13 09.6	24	17 17 40.74	15.183	23 11 30.1	15.76	1 07.5
28	17 15 47.05	10.255	23 08 22.7	10.19	12 53.2	28	17 18 41.98	15.427	23 12 32.9	15.65	0 52.8
June 1	17 15 05.59	10.466	23 07 41.1	10.59	12 36.8	Dec. 2	17 19 44.09	15.615	23 13 35.2	15.49	0 38.1
5	17 14 23.42	10.605	23 06 58.1	10.91	12 20.4	6	17 20 46.84	15.749	23 14 36.7	15.25	0 23.4
9	17 13 40.85	10.668	- 23 06 13.9	+ 11.19	12 03.9	10	17 21 50.01	+ 15.828	23 15 37.1	- 14.93	0 08.7
13	17 12 58.17	10.659	23 05 28.7	11.39	11 47.5	14	17 22 53.40	15.857	23 16 36.1	14.56	23 50 3
17	17 12 15.68	10.575	23 04 42.9	11.49	11 31.1	18	17 23 56.80	15.834	23 17 33.6	14.18	23 35.7
21	17 11 33.66	10.426	23 03 56.9	11.50	11 14.6	22	17 25 00.01	15.763	23 18 29.5	13.74	23 21.0
25	17 10 52.36	10.212	23 03 11.0	11.44	10 58.2	26	17 26 02.83	15.637	23 19 23.5	13.27	23 06.3
29	17 10 12.05	- 9.932	23 02 25.5	+ 11.29	10 41.8	30	17 27 05.03	+ 15.453	- 23 20 15.6	12.77	22 51.6
July 3	17 09 32.99	9.587	- 23 01 40 8	+ 11.04	10 25.5	34	17 28 06.38	+ 15.214	23 21 05.6	12.23	22 36.9

Greatest semidiameter,   June 10, 1.85″   Greatest horizontal parallax,   June 10, 0.49″
Least semidiameter,   December 14, 1.66″   Least horizontal parallax,   December 14, 0.44″

GREENWICH MEAN TIME.

Month and Day	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.	Month and Day	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
Jan. 0	5 59 16.12	− 7.244	+ 22 15 12.2	+ 0.82	11 20.5	July 3	6 06 41.86	+ 9.571	+ 22 20 46.7	− 1.36	23 20.7
4	5 58 47.39	7.114	22 15 15.7	0.92	11 04.3	7	6 07 19.97	9.478	22 20 40.7	1.62	23 05.6
8	5 58 19.25	6.947	22 15 19.6	1.02	10 48.1	11	6 07 57.64	9.349	22 20 33.7	1.89	22 50.5
12	5 57 51.92	6.725	22 15 23.9	1.14	10 31.9	15	6 08 34.72	9.186	22 20 25.6	2.12	22 35.4
16	5 57 25.56	6.450	22 15 28.7	1.25	10 15.8	19	6 09 11.09	8.996	22 20 16.7	2.34	22 20.3
20	5 57 00.37	− 6.140	+ 22 15 33.9	+ 1.36	9 59.6	23	6 09 46.65	+ 8.777	+ 22 20 06.9	− 2.55	22 05.2
24	5 56 36.49	5.795	22 15 39.6	1.49	9 43.5	27	6 10 21.26	8.525	22 19 56.3	2.72	21 50.0
28	5 56 14.06	5.414	22 15 45.8	1.61	9 27.4	31	6 10 54.81	8.240	22 19 45.1	2.89	21 34.8
Feb.1	5 55 53.23	4.994	22 15 52.5	1.74	9 11.4	Aug. 4	6 11 27.18	7.934	22 19 33.2	3.02	21 19.6
5	5 55 34.15	4.545	22 15 59.7	1.87	8 55.3	8	6 11 58.25	7.595	22 19 20.9	3.14	21 04.4
9	5 55 16.91	− 4.067	+ 22 16 07.5	+ 2.01	8 39.3	12	6 12 27.90	+ 7.225	+ 22 19 08.1	− 3.23	20 49.1
13	5 55 01.65	3.561	22 16 15.8	2.14	8 23.3	16	6 12 56.02	6.832	22 18 55.1	3.28	20 33.9
17	5 54 48.45	3.032	22 16 24.6	2.26	8 07.3	20	6 13 22.53	6.418	22 18 41.9	3.31	20 18.6
21	5 54 37.41	2.486	22 16 33.9	2.40	7 51.4	24	6 13 47.33	5.979	22 18 28.6	3.31	20 03.3
25	5 54 28.58	1.927	22 16 43.8	2.53	7 35.5	28	6 14 10.33	5.516	22 18 15.4	3.30	19 47.9
Mar.1	5 54 22.01	− 1.356	+ 22 16 54.2	+ 2.66	7 19.7	Sept.1	6 14 31.43	+ 5.031	+ 22 18 02.2	− 3.27	19 32.5
5	5 54 17.75	0.771	22 17 05.0	2.76	7 03.9	5	6 14 50.55	4.523	22 17 49.3	3.18	19 17.1
9	5 54 15.85	− 0.178	22 17 16.2	2.86	6 48.2	9	6 15 07.59	3.998	22 17 36.8	3.08	19 01.7
13	5 54 16.32	+ 0.414	22 17 27.8	2.95	6 32.4	13	6 15 22.52	3.462	22 17 24.7	2.96	18 46.2
17	5 54 19.16	1.003	22 17 39.8	3.03	6 16.8	17	6 15 35.27	2.912	22 17 13.4	2.81	18 30.7
21	5 54 24.34	+ 1.588	+ 22 17 52.0	+ 3.09	6 01.1	21	6 15 45.80	+ 2.350	+ 22 17 02.2	− 2.64	18 15.1
25	5 54 31.86	2.170	22 18 04.5	3.14	5 45.6	25	6 15 54.06	1.779	22 16 52.0	2.45	17 59.5
29	5 54 41 69	2.745	22 18 17.1	3.17	5 30.0	29	6 16 00.02	1.198	22 16 42.6	2.27	17 43.9
Apr. 2	5 54 53.80	3.304	22 18 29.8	3.19	5 14.5	Oct. 3	6 16 03.64	0.613	22 16 34.1	2.06	17 28.2
6	5 55 08.11	3.853	22 18 42.6	3.18	4 59.0	7	6 16 04.92	+ 0.026	22 16 26.4	1.80	17 12.5
10	5 55 24.61	+ 4.391	+ 22 18 55.2	+ 3.14	4 43.5	11	6 16 03.85	0.557	+ 22 16 19.7	− 1.54	16 56.7
14	5 55 43.21	4.907	22 19 07.7	3.09	4 28.1	15	6 16 00.47	1.132	22 16 14.1	1.27	16 40.9
18	5 56 03.84	5.401	22 19 19.9	3.01	4 12.7	19	6 15 54.80	1.701	22 16 09.5	1.01	16 25.1
22	5 56 26.39	5.872	22 19 31.8	2.92	3 57.4	23	6 15 46.87	2.264	22 16 06.0	0.75	16 09.2
26	5 56 50.78	6.322	22 19 43.3	2.81	3 42.1	27	6 15 36.71	2.810	22 16 03.5	0.50	15 53.3
30	5 57 16.93	+ 6.751	+ 22 19 54.3	+ 2.66	3 26.8	31	6 15 24.41	− 3.342	+ 22 16 02.0	− 0.24	15 37.4
May 4	5 57 44.75	7.153	22 20 04.6	2.50	3 11.5	Nov. 4	6 15 10.00	3.845	22 16 01.6	+ 0.04	15 21.4
8	5 58 14.12	7.530	22 20 14.3	2.33	2 56.3	8	6 14 53.61	4.330	22 16 02.3	0.29	15 05.4
12	5 58 44.95	7.878	22 20 23.2	2.13	2 41.1	12	6 14 35.32	4.798	22 16 03.9	0.53	14 49.4
16	5 59 17.10	8.192	22 20 31.3	1.91	2 25.9	16	6 14 15.27	5.224	22 16 06.5	0.76	14 33.3
20	5 59 50.45	+ 8.478	+ 22 20 38.5	+ 1.69	2 10.7	20	6 13 53.57	− 5.620	+ 22 16 10.0	+ 0.99	14 17.2
24	6 00 24.89	8.737	22 20 44.8	1.44	1 55.5	24	6 13 30.35	5.987	22 16 14.4	1.20	14 01.1
28	6 01 00.30	8.965	22 20 50.0	1.17	1 40.3	28	6 13 05.73	6.313	22 16 19.6	1.39	13 45.0
June 1	6 01 36.57	9.164	22 20 54.2	0.90	1 25.2	Dec. 2	6 12 39.90	6.597	22 16 25.5	1.56	13 28.8
5	6 02 13.57	9.330	22 20 57.2	0.61	1 10.1	6	6 12 13.01	6.838	22 16 32.1	1.74	13 12.6
9	6 02 51.17	+ 9.464	+ 22 20 59.1	+ 0.34	0 55.0	10	6 11 45.26	− 7.031	+ 22 16 39.4	+ 1.89	12 56.4
13	6 03 29.23	9.560	22 20 59.9	+ 0.06	0 39.9	14	6 11 16.82	7.181	22 16 47.2	2.01	12 40.2
17	6 04 07.61	9.624	22 20 59.6	− 0.22	0 24.8	18	6 10 47.87	7.287	22 16 55.5	2.14	12 24.0
21	6 04 46.19	9.659	22 20 58.1	0.52	0 09.7	22	6 10 18.59	7.346	22 17 04.3	2.26	12 07.8
25	6 05 24.84	9.662	22 20 55.4	0.81	23 50.9	26	6 09 49.17	7.356	22 17 13.6	2.35	11 51.6
29	6 06 03.44	+ 9.633	+ 22 20 51.6	− 1.09	23 35.8	30	6 09 19.81	− 7.317	+ 22 17 23.1	+ 2.42	11 35.4
July 3	6 06 41.86	+ 9.571	+ 22 20 46.7	− 1.36	23 20.7	34	6 08 50.70		+ 22 17 33.0		11 19.2

Least semidiameter, June 23, 1.24"
Greatest semidiameter, December 24, 1.33"

Least horizontal parallax, June 23, 0.29"
Greatest horizontal parallax, December 24, 0.31"

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 1	278 46 43.3	+ 2 52 31.7	+ 12 31.2	− 5 29 57.9	− 13 02.4	9.660 1438	0.158 0422	0.157 6974
2	281 40 12.5	2 54 29.1	12 09.3	5 42 38.8	12 19.4	9.657 8504	0.157 3079	0.156 8731
3	284 35 46.3	2 56 40.8	11 39.6	5 54 35.6	11 33.7	9.655 2910	0.156 3925	0.155 8656
4	287 33 39.0	2 59 07.0	11 02.2	6 05 45.1	10 44.9	9.652 4644	0.155 2920	0.154 6707
5	290 34 05.3	3 01 48.3	10 17.0	6 16 04.2	9 52.9	9.649 3702	0.154 0011	0.153 2826
6	293 37 20.8	+ 3 04 45.3	+ 9 24.2	− 6 25 29.6	− 8 57.2	9.646 0073	0.152 5144	0.151 6958
7	296 43 41.4	3 07 58.6	8 24.0	6 33 57.3	7 57.5	9.642 3758	0.150 8257	0.149 9031
8	299 53 23.6	3 11 28.8	7 16.7	6 41 23.2	6 53.5	9.638 4755	0.148 9270	0.147 8966
9	303 06 44.8	3 15 16.6	6 02.7	6 47 42.7	5 44.7	9.634 3072	0.146 8105	0.145 6678
10	306 24 02.8	3 19 22.6	4 42.5	6 52 50.8	4 30.6	9.629 8721	0.144 4672	0.143 2074
11	309 45 36.3	+ 3 23 47.6	+ 3 16.8	− 6 56 42.0	− 3 10.9	9.625 1727	0.141 8870	0.140 5046
12	313 11 44.6	3 28 32.3	1 46.4	6 59 10.5	1 45.0	9.620 2121	0.139 0588	0.137 5480
13	316 42 47.7	3 33 37.4	+ 0 12.3	7 00 09.7	− 0 12.3	9.614 9952	0.135 9706	0.134 3248
14	320 19 06.5	3 39 03.7	− 1 24.4	6 59 32.8	+ 1 27.3	9.609 5286	0.132 6089	0.130 8211
15	324 01 02.3	3 44 51.5	3 02.2	6 57 12.5	3 14.7	9.603 8206	0.128 9594	0.127 0218
16	327 48 56.9	+ 3 51 01.5	− 4 39.4	− 6 53 00.8	+ 5 10.1	9.597 8818	0.125 0062	0.122 9107
17	331 43 12.7	3 57 33.9	6 14.3	6 46 49.6	7 13.7	9.591 7265	0.120 7329	0.118 4704
18	335 44 12.2	4 04 28.8	7 44.8	6 38 30.5	9 26.1	9.585 3717	0.116 1208	0.113 6818
19	339 52 17.8	4 11 46.1	9 08.4	6 27 54.6	11 47.2	9.578 8385	0.111 1506	0.108 5247
20	344 07 51.7	4 19 25.3	10 22.8	6 14 53.4	14 16.6	9.572 1525	0.105 8015	0.102 9783
21	348 31 15.4	+ 4 27 25.5	− 11 25.1	− 5 59 18.7	+ 16 54.2	9.565 3445	0.100 0523	0.097 0205
22	353 02 49.1	4 35 45.1	12 12.6	5 41 02.5	19 39.3	9.558 4511	0.093 8860	0.090 6280
23	357 42 51.3	4 44 21.9	12 42.5	5 19 58.0	22 30.6	9.551 5150	0.087 2615	0.083 7775
24	2 31 37.7	4 53 13.0	12 52.2	4 55 59.9	25 26.2	9.544 5860	0.080 1733	0.076 4458
25	7 29 20.8	5 02 14.6	12 39.5	4 29 04.9	28 23.9	9.537 7208	0.072 5924	0.068 6102
26	12 36 08.9	+ 5 11 22.1	− 12 02.6	− 3 59 12.5	+ 31 20.6	9.530 9836	0.064 4967	0.060 2494
27	17 52 04.9	5 20 29.3	11 00.5	3 26 25.4	34 12.4	9.524 4459	0.055 8660	0.051 3447
28	23 17 05.1	5 29 29.3	9 33.3	2 50 50.8	36 54.9	9.518 1854	0.046 6835	0.041 8810
29	28 50 58.3	5 38 13.9	7 42.3	2 12 40.4	39 23.0	9.512 2850	0.036 9361	0.031 8483
30	34 33 24.7	5 46 34.0	5 30.2	1 32 11.6	41 30.8	9.506 8316	0.026 6175	0.021 2440
31	40 23 54.8	+ 5 54 19.5	− 3 01.5	− 0 49 47.5	+ 43 12.6	9.501 9130	0.015 7290	0.010 0739
Feb. 1	46 21 48.7	6 01 20.0	− 0 21.8	− 0 05 56.9	44 22.8	9.497 6154	0.004 2813	9.998 3545
2	52 26 16.2	6 07 24.7	+ 2 21.7	+ 0 38 45.8	44 56.0	9.494 0197	9.992 2979	9.986 1163
3	58 36 16.2	6 12 23.4	5 01.1	1 23 41.6	44 48.4	9.491 1979	9.979 8160	9.973 4041
4	64 50 38.0	6 16 06.9	7 28.1	2 08 08.3	43 57.5	9.489 2094	9.966 8892	9.960 2806
5	71 08 02.4	+ 6 18 27.7	+ 9 34.7	+ 2 51 22.0	+ 42 22.5	9.488 0976	9.953 5891	9.946 8268
6	77 27 03.7	6 19 20.2	11 13.8	3 32 39.3	40 05.1	9.487 8873	9.940 0068	9.933 1436
7	83 46 12.5	6 18 41.8	12 20.1	4 11 19.3	37 08.7	9.488 5833	9.926 2531	9.919 3523
8	90 03 57.4	6 16 33.0	12 50.4	4 46 45.7	33 38.9	9.490 1699	9.912 4596	9.905 5942
9	96 18 49.4	6 12 56.8	12 43.8	5 18 28.4	29 42.7	9.492 6120	9.898 7765	9.892 0280
10	102 29 23.9	+ 6 07 59.2	+ 12 01.7	+ 5 46 04.8	+ 25 27.7	9.495 8574	9.885 3709	9.878 8270
11	108 34 23.5	6 01 48.6	10 47.8	6 09 20.1	21 01.7	9.499 8393	9.872 4222	9.866 1776
12	114 32 40.2	5 54 35.3	9 07.0	6 28 07.2	16 32.6	9.504 4806	9.860 1180	9.854 2666
13	120 23 16.8	5 46 30.3	7 05.6	6 42 26.6	12 07.4	9.509 6973	9.848 6464	9.843 2798
14	126 05 27.4	5 37 45.3	4 50.3	6 52 25.1	7 51.6	9.515 4016	9.838 1882	9.833 3921
15	131 38 37.8	+ 5 28 31.6	+ 2 27.5	+ 6 58 14.4	+ 3 49.8	9.521 5060	9.828 9097	9.824 7580
16	137 02 24.7	+ 5 19 00.1	+ 0 03.5	+ 7 00 10.4	+ 0 05.4	9.527 9255	9.820 9516	9.817 5034

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Feb. 15	131 38 37.8	+ 5 28 31.6	+ 2 27.5	+ 6 58 14.4	+ 3 49.8	9.521 5060	9.828 9097	9.824 7580
16	137 02 24.7	5 19 00.1	+ 0 03.5	7 00 10.4	+ 0 05.4	9.527 9255	9.820 9516	9.817 5034
17	142 16 35.2	5 09 20.3	− 2 16.4	6 58 31.5	− 3 19.8	9.534 5795	9.814 4234	9.811 7195
18	147 21 05.3	4 59 40.6	4 27.8	6 53 37.5	6 24.7	9.541 3938	9.809 3967	9.807 4573
19	152 15 58.8	4 50 08.2	6 27.1	6 45 48.8	9 09.2	9.548 3010	9.805 9014	9.804 7264
20	157 01 26.0	+ 4 40 48.8	− 8 11.9	+ 6 35 25.8	−· 11 33.5	9.555 2405	9.803 9272	9.803 4963
21	161 37 42.2	4 31 46.7	9 40.6	6 22 48.0	13 39.0	9.562 1596	9.803 4240	9.803 6993
22	166 05 06.4	4 23 05.4	10 52.4	6 08 13.6	15 26.8	9.569 0123	9.804 3090	9.805 2390
23	170 24 00.8	4 14 47.4	11 46.9	5 51 59.8	16 58.2	9.575 7590	9.806 4737	9.807 9967
24	174 34 49.4	4 06 54.0	12 24.6	5 34 22.0	18 15.1	9.582 3665	9.809 7909	9.811 8390
25	178 37 57.3	+ 3 59 26.2	− 12 46.0	+ 5 15 34.1	− 19 18.6	9.588 8070	9.814 1235	9.816 6267
26	182 33 50.4	3 52 24.3	12 52.2	4 55 48.7	20 10.4	9.595 0571	9.819 3314	9.822 2205
27	186 22 54.5	3 45 48.2	12 44.4	4 35 16.7	20 51.9	9.601 0981	9.825 2774	9.828 4860
28	190 05 35.3	3 39 37.6	12 23.7	4 14 07.9	21 24.3	9.606 9147	9.831 8311	9.835 2982
Mar. 1	193 42 18.0	3 33 51.8	11 51.6	3 52 30.7	21 48.8	9.612 4945	9.838 8732	9.842 5430
2	197 13 27.0	+ 3 28 30.1	− 11 09.3	+ 3 30 32.5	− 22 06.5	9.617 8282	9.846 2950	9.850 1181
3	200 39 26.0	3 23 31.7	10 18.4	3 08 19.6	22 18.3	9.622 9083	9.854 0015	9.857 9353
4	204 00 37.9	3 18 55.7	9 20.0	2 45 57.7	22 24.8	9.627 7291	9.861 9102	9.865 9176
5	207 17 24.4	3 14 40.8	8 15.4	2 23 31.5	22 26.9	9.632 2870	9.869 9497	9.873 9996
6	210 30 06.3	3 10 46.4	7 05.8	2 01 05.1	22 25.2	9.636 5792	9.878 0606	9.882 1267
7	213 39 03.7	+ 3 07 11.6	− 5 52.3	+ 1 38 42.1	− 22 20.3	9.640 6039	9.886 1926	9.890 2534
8	216 44 35.7	3 03 55.3	4 35.9	1 16 25.5	22 12.5	9.644 3599	9.894 3049	9.898 3429
9	219 47 00.3	3 00 56.8	3 17.7	0 54 17.9	22 02.2	9.647 8472	9.902 3641	9.906 3654
10	222 46 35.1	2 58 15.4	1 58.5	0 32 21.8	21 49.7	9.651 0658	9.910 3438	9.914 2966
11	225 43 36.6	2 55 50.2	− 0 39.1	+ 0 10 39.0	21 35.5	9.654 0161	9.918 2220	9.922 1180
12	228 38 20.8	+ 2 53 40.7	+ 0 39.7	− 0 10 48.7	− 21 19.6	9.656 6992	9.925 9833	9.929 8159
13	231 31 03.0	2 51 46.1	1 57.1	0 31 59.7	21 02.2	9.659 1157	9.933 6148	9.937 3790
14	234 21 57.9	2 50 06.1	3 12.6	0 52 52.7	20 43.6	9.661 2665	9.941 1076	9.944 7998
15	237 11 19.9	2 48 40.1	4 25.5	1 13 26.4	20 23.6	9.663 1528	9.948 4552	9.952 0731
16	239 59 22.6	2 47 27.6	5 35.2	1 33 39.5	20 02.5	9.664 7754	9.955 6534	9.959 1956
17	242 46 19.5	+ 2 46 28.3	+ 6 41.3	− 1 53 31.1	− 19 40.4	9.666 1356	9.962 6995	9.966 1651
18	245 32 23.6	2 45 42.0	7 43.3	2 13 00.0	19 17.3	9.667 2338	9.969 5925	9.972 9818
19	248 17 47.7	2 45 08.3	8 40.7	2 32 05.2	18 53.1	9.668 0707	9.976 3329	9.979 6457
20	251 02 44.3	2 44 47.0	9 33.0	2 50 45.8	18 27.8	9.668 6470	9.982 9207	9.986 1583
21	253 47 25.9	2 44 38.2	10 20.0	3 09 00.6	18 01.5	9.668 9632	9.989 3585	9.992 5210
22	256 32 04.8	+ 2 44 41.6	+ 11 01.3	− 3 26 48.5	− 17 34.0	9.669 0195	9.995 6465	9.998 7355
23	259 16 53.1	2 44 57.1	11 36.5	3 44 08.3	17 05.4	9.668 8157	0.001 7883	0.004 8055
24	262 02 03.0	2 45 24.8	12 05.3	4 00 58.8	16 35.4	9.668 3517	0.007 7870	0.010 7330
25	264 47 46.8	2 46 04.8	12 27.5	4 17 18.6	16 04.2	9.667 6272	0.013 6438	0.016 5199
26	267 34 16.8	2 46 57.3	12 42.8	4 33 06.4	15 31.2	9.666 6420	0.019 3616	0.022 1693
27	270 21 45.6	+ 2 48 02.3	+ 12 50.9	− 4 48 20.4	− 14 56.6	9.665 3950	0.024 9433	0.027 6837
28	273 10 25.7	2 49 20.0	12 51.7	5 02 50.0	14 20.2	9.663 8859	0.030 3908	0.033 0651
29	276 00 30.0	2 50 50.9	12 45.0	5 17 00.1	13 41.8	9.662 1136	0.035 7068	0.038 3161
30	278 52 11.9	2 52 35.1	12 30.6	5 30 21.8	13 01.2	9.660 0771	0.040 8932	0.043 4384
31	281 45 44.8	2 54 33.0	12 08.5	5 43 01.6	12 18.0	9.657 7755	0.045 9518	0.048 4334
Apr. 1	284 41 22.6	+ 2 56 45.0	+ 11 38.6	− 5 54 56.9	− 11 32.1	9.655 2078	0.050 8834	0.053 3021
2	287 39 19.7	+ 2 59 11.7	+ 11 00.9	− 6 06 04.9	− 10 43.4	9.652 3730	0.055 6894	0.058 0455

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr. 1	284 41 22.6	+ 2 56 45.0	+ 11 38.6	− 5 54 56.9	− 11 32.1	9.655 2078	0.050 8834	0.053 3021
2	287 39 19.7	2 59 11.7	11 00.9	6 06 04.9	10 43.4	9.652 3730	0.055 6894	0.058 0455
3	290 39 51.0	3 01 53.5	10 15.5	6 16 22.5	9 51.2	9.649 2704	0.060 3704	0.062 6640
4	293 43 11.9	3 04 51.0	9 22.5	6 25 46.1	8 55.3	9.645 8992	0.064 9262	0.067 1572
5	296 49 38.4	3 08 04.8	8 22.1	6 34 11.9	7 55.6	9.642 2593	0.069 3567	0.071 5246
6	299 59 27.2	+ 3 11 35.7	+ 7 14.5	− 6 41 35.9	− 6 51.5	9.638 3505	0.073 6607	0.075 7648
7	303 12 55.4	3 15 23.8	6 00.3	6 47 53.3	5 42.5	9.634 1739	0.077 8366	0.079 8758
8	306 30 21.0	3 19 30.4	4 40.0	6 52 59.1	4 28.2	9.629 7305	0.081 8820	0.083 8550
9	309 52 02.6	3 23 56.0	3 14.1	6 56 47.9	3 08.3	9.625 0228	0.085 7942	0.087 6991
10	313 18 19.7	3 28 41.5	1 43.5	6 59 13.7	1 42.2	9.620 0541	0.089 5692	0.091 4039
11	316 49 32.4	+ 3 33 47.3	+ 0 09.3	− 7 00 10.1	− 0 09.4	9.614 8291	0.093 2024	0.094 9642
12	320 26 01.3	3 39 14.1	− 1 27.4	6 59 30.1	+ 1 30.6	9.609 3547	0.096 6883	0.098 3741
13	324 08 07.8	3 45 02.7	3 05.2	6 57 06.4	3 18.1	9.603 6392	0.100 0204	0.101 6265
14	327 56 14.0	3 51 13.3	4 42.4	6 52 51.2	5 13.7	9.597 6935	0.103 1910	0.104 7129
15	331 50 41.9	3 57 46.4	6 17.2	6 46 36.2	7 17.6	9.591 5315	0.106 1910	0.107 6240
16	335 51 54.3	+ 4 04 42.1	− 7 47.5	− 6 38 13.1	+ 9 30.3	9.585 1707	0.109 0105	0.110 3491
17	340 00 13.5	4 12 00.1	9 10.9	6 27 32.8	11 51.6	9.578 6321	0.111 6380	0.112 8758
18	344 16 01.8	4 19 40.0	10 24.9	6 14 27.1	14 21.3	9.571 9418	0.114 0605	0.115 1905
19	348 39 40.5	4 27 40.8	11 26.8	5 58 47.4	16 59.3	9.565 1303	0.116 2636	0.117 2781
20	353 11 29.8	4 36 00.9	12 13.8	5 40 26.1	19 44.5	9.558 2345	0.118 2316	0.119 1222
21	357 51 48.0	+ 4 44 38.2	− 12 43.1	− 5 19 16.3	+ 22 35.9	9.551 2975	0.119 9473	0.120 7046
22	2 40 51.0	4 53 29.9	12 52.2	4 55 12.8	25 31.7	9.544 3693	0.121 3916	0.122 0058
23	7 38 51.2	5 02 31.8	12 38.7	4 28 12.3	28 29.5	9.537 5067	0.122 5444	0.123 0050
24	12 45 56.5	5 11 39.3	12 01.0	3 58 14.3	31 25.9	9.530 7746	0.123 3846	0.123 6806
25	18 02 09.7	5 20 46.4	10 58.2	3 25 22.0	34 17.6	9.524 2441	0.123 8890	0.124 0095
26	23 27 26.8	+ 5 29 46.0	− 9 30.2	− 2 49 42.3	+ 36 59.9	9.517 9933	0.124 0367	0.123 9689
27	29 01 36.6	5 38 30.1	7 38.5	2 11 27.3	39 27.3	9.512 1054	0.123 8030	0.123 5360
28	34 44 18.7	5 46 49.2	5 25.9	1 30 54.5	41 34.4	9.506 6671	0.123 1654	0.122 6883
29	40 35 03.5	5 54 33.7	2 56.7	0 48 27.2	43 15.4	9.501 7664	0.122 1023	0.121 4047
30	46 33 10.8	6 01 32.6	− 0 16.8	− 0 04 34.4	44 24.4	9.497 4892	0.120 5934	0.119 6663
May 1	52 37 49.8	+ 6 07 35.3	+ 2 26.7	+ 0 40 09.4	+ 44 56.5	9.493 9164	0.118 6215	0.117 4569
2	58 47 59.4	6 12 31.9	5 05.9	1 25 05.0	44 47.5	9.491 1196	0.116 1715	0.114 7636
3	65 02 28.4	6 16 13.0	7 32.4	2 09 30.1	43 55.2	9.489 1578	0.113 2327	0.111 5778
4	71 19 57.5	6 18 30.9	9 38.2	2 52 40.9	42 18.9	9.488 0738	0.109 7988	0.107 8952
5	77 39 00.8	6 19 20.7	11 16.4	3 33 53.9	40 00.1	9.487 8918	0.105 8676	0.103 7163
6	83 58 08.6	+ 6 18 39.6	+ 12 21.6	+ 4 12 28.4	+ 37 02.7	9.488 6159	0.101 4424	0.099 0466
7	90 15 49.7	6 16 27.8	12 50.7	4 47 48.3	33 32.0	9.490 2300	0.096 5309	0.093 8966
8	96 30 35.2	6 12 49.0	12 43.0	5 19 23.7	29 35.0	9.492 6983	0.091 1459	0.088 2806
9	102 41 00.6	6 07 48.9	11 59.9	5 46 52.2	25 19.5	9.495 9679	0.085 3035	0.082 2171
10	108 45 48.8	6 01 36.2	10 45.0	6 09 59.2	20 53.4	9.499 0719	0.079 0242	0.075 7275
11	114 43 52.2	+ 5 54 21.1	+ 9 03.5	+ 6 28 38.0	+ 16 24.4	9.504 6327	0.072 3303	0.068 8356
12	120 34 13.9	5 46 14.7	7 01.6	6 42 49.2	11 59.3	9.509 8660	0.065 2467	0.061 5669
13	126 16 08.3	5 37 28.5	4 45.9	6 52 39.7	7 43.8	9.515 5844	0.057 7995	0.053 9479
14	131 49 01.5	5 28 14.1	+ 2 23.0	6 58 21.5	+ 3 42.5	9.521 7001	0.050 0154	0.046 0054
15	137 12 30.6	5 18 42.1	− 0 00.9	7 00 10.5	− 0 01 3	9.528 1282	0.041 9211	0.037 7659
16	142 26 23.1	+ 5 09 02.2	− 2 20.6	+ 6 58 25.2	− 3 25.9	9.534 7886	0.033 5430	0.029 2555
17	147 30 35.2	+ 4 59 22.6	− 4 31.7	+ 6 53 25.4	− 6 30.1	9.541 6070	0.024 9064	0.020 4991

MERCURY.

GREENWICH MEAN NOON.

Date	Heliocentric Longitude. Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
May 17	147 30 35.2	+ 4 59 22.6	− 4 31.7	+ 6 53 25.4	− 6 30.1	9.541 6070	0.024 9064	0.020 4991
18	152 25 10.9	4 49 50.5	6 30.6	6 45 31.7	9 13.9	9.548 5161	0.016 0363	0.011 5212
19	157 10 20.7	4 40 31.7	8 14.9	6 35 04.2	11 37.8	9.555 4559	0.006 9564	0.002 3448
20	161 46 20.0	4 31 30.2	9 43.1	6 22 22.4	13 42.6	9.562 3738	9.997 6891	9.992 9920
21	166 13 28.0	4 22 49.6	10 54.3	6 07 44.8	15 29.8	9.569 2238	9.988 2560	9.983 4839
22	170 32 06.9	+ 4 14 32.2	− 11 48.3	+ 5 51 28.1	− 17 00.9	9.575 9669	9.978 6781	9.973 8412
23	174 42 40.7	4 05 39.6	12 25.5	5 33 47.9	18 17.2	9.582 5697	9.968 9750	9.964 0826
24	178 45 34.7	3 59 12.6	12 46.4	5 14 58.1	19 20.4	9.589 0046	9.959 1661	9.954 2279
25	182 41 14.6	3 52 11.5	12 52.2	4 55 11.0	20 11.9	9.595 2483	9.949 2702	9.944 2954
26	186 30 06.3	3 45 36.2	12 43.9	4 34 37.8	20 53.0	9.601 2826	9.939 3059	9.932 3040
27	190 12 35.5	+ 3 39 26.4	− 12 22.9	+ 4 13 27.9	− 21 25.3	9.607 0920	9.929 2921	9.924 2726
28	193 49 07.4	3 33 41.5	11 50.4	3 51 49.9	21 49.5	9.612 6645	9.919 2479	9.914 2206
29	197 20 06.3	3 28 20.5	11 07.9	3 29 51.2	22 06.9	9.617 9904	9.909 1931	9.904 1679
30	200 45 56.2	3 23 22.8	10 16.7	3 07 38.0	22 18.6	9.623 0623	9.899 1478	9.894 1354
31	204 06 59.5	3 18 47.4	9 18.0	2 45 15.8	22 24.9	9.627 8751	9.889 1337	9.884 1454
June 1	207 23 38.0	+ 3 14 33.1	− 8 13.3	+ 2 22 49.6	− 22 26.9	9.632 4246	9.879 1736	9.874 2213
2	210 36 12.6	3 10 39.4	7 03.5	2 00 23.2	22 25.2	9.636 7085	9.869 2918	9.864 3885
3	213 45 03.3	3 07 05.2	5 49.9	1 38 00.3	22 20.1	9.640 7247	9.859 5149	9.854 6744
4	216 50 29.2	3 03 49.5	4 33.5	1 15 44.0	22 12.2	9.644 4724	9.849 8709	9.845 1083
5	219 52 48.3	3 00 51.6	3 15.2	0 53 36.8	22 01.9	9.647 9512	9.840 3908	9.835 7224
6	222 52 18.0	+ 2 58 10.6	− 1 56.0	+ 0 31 41.0	− 21 49.4	9.651 1614	9.831 1078	9.826 5513
7	225 49 15.0	2 55 46.0	− 0 36.7	+ 0 09 58.7	21 35.0	9.654 1033	9.822 0578	9.817 6321
8	228 43 55.2	2 53 36.9	+ 0 42.1	− 0 11 28.5	21 19.1	9.656 7781	9.813 2794	9.809 0049
9	231 36 33.8	2 51 42.8	1 59.5	0 32 39.0	21 01.7	9.659 1863	9.804 8142	9.800 7128
10	234 27 25.7	2 50 03.3	3 14.9	0 53 31.4	20 42.9	9.661 3286	9.796 7066	9.792 8012
11	237 16 45.0	+ 2 48 37.6	+ 4 27.7	− 1 14 04.4	− 20 22.9	9.663 2072	9.789 0029	9.785 3178
12	240 04 45.5	2 47 25.5	5 37.3	1 34 16.9	20 01.9	9.664 8217	9.781 7522	9.778 3123
13	242 51 40.5	2 46 26.7	6 43.3	1 54 07.8	19 39.7	9.666 1735	9.775 0046	9.771 8354
14	245 37 43.2	2 45 40.8	7 45.1	2 13 36.0	19 16.5	9.667 2635	9.768 8112	9.765 9385
15	248 23 06.3	2 45 07.5	8 42.4	2 32 40.5	18 52.3	9.668 0923	9.763 2235	9.760 6727
16	251 08 02.3	+ 2 44 46.6	+ 9 34.6	− 2 51 20.3	− 18 27.0	9.668 6606	9.758 2919	9.756 0873
17	253 52 43.6	2 44 38.1	10 21.4	3 09 34.2	18 00.7	9.668 9687	9.754 0644	9.752 2289
18	256 37 22.6	2 44 41.9	11 02.5	3 27 21.3	17 33.2	9.669 0168	9.750 5860	9.749 1408
19	259 22 11.4	2 44 57.8	11 37.5	3 44 40.2	17 04.4	9.668 8050	9.747 8978	9.746 8611
20	262 07 22.2	2 45 25.8	12 06.1	4 01 29.7	16 34.4	9.668 3328	9.746 0346	9.745 4215
21	264 53 07.2	+ 2 46 06.3	+ 12 28.1	− 4 17 48.6	− 16 03.1	9.667 6003	9.745 0246	9.744 8464
22	267 39 38.9	2 46 59.2	12 43.1	4 33 35.4	15 30.1	9.666 6068	9.744 8884	9.745 1519
23	270 27 09.7	2 48 04.6	12 51.0	4 48 48.3	14 55.4	9.665 3519	9.745 6375	9.746 3453
24	273 15 52.3	2 49 22.7	12 51.6	5 03 25.7	14 18.9	9.663 8346	9.747 2749	9.748 4253
25	276 05 59.5	2 50 53.9	12 44.6	5 17 25.6	13 40.5	9.662 0540	9.749 7949	9.751 3813
26	278 57 44.6	+ 2 52 38.6	+ 12 30.0	− 5 30 46.0	− 12 59.8	9.660 0094	9.753 1819	9.755 1937
27	281 51 21.2	2 54 36.9	12 07.7	5 43 24.4	12 16.7	9.657 6994	9.757 4130	9.759 8352
28	284 47 03.1	2 56 49.4	11 37.5	5 55 18.4	11 30.8	9.655 1235	9.762 4560	9.765 2706
29	287 45 04.8	2 59 16.5	10 59.6	6 06 24.9	10 41.7	9.652 2806	9.768 2736	9.771 4595
30	290 45 41.2	3 01 58.8	10 14.0	6 16 40.8	9 49.5	9.649 1696	9.774 8223	9.778 3560
July 1	293 49 07.7	+ 3 04 56.8	+ 9 20.7	− 6 26 02.7	− 8 53.6	9.645 7901	9.782 0541	9.785 9105
2	296 55 40.3	+ 3 08 11.3	+ 8 20.1	− 6 34 26.7	− 7 53.7	9.642 1417	9.789 9183	9.794 0709

MERCURY.

GREENWICH MEAN NOON

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Ju·y 1	293 49 07.7	+ 3 04 56.8	+ 9 20.7	− 6 26 02.7	− 8 53.6	9.645 7901	9.782 0541	9.785 9105
2	296 55 40.3	3 08 11.3	8 20.1	6 34 26.7	7 53.7	9.642 1417	9.789 9183	9.794 0709
3	300 05 35.6	3 11 42.4	7 12.3	6 41 48.6	6 49.4	9.638 2247	9.798 3615	9.802 7833
4	303 19 10.9	3 15 31.2	5 57.9	6 48 ·03.9	5 40.3	9.634 0397	9.807 3297	9.811 9933
5	306 36 44.1	3 19 38.3	4 37.4	6 53 07.5	4 25.8	9.629 5882	9.816 7693	9.821 6490
6	309 58 34.0	+ 3 24 04.7	+ 3 11.3	− 6 56 53.7	− 3 05.7	9.624 8724	9.826 6267	9.831 6960
7	313 25 00.0	3 28 50.7	1 40.7	6 59 16.8	1 39.4	9.619 8958	9.836 8506	9.842 0839
8	316 56 22.2	3 33 57.1	+ 0 06.3	7 00 10.3	− 0 06.4	9.614 6630	9.847 3901	9.852 7632
9	320 33 01.3	3 39 24.6	− 1 30.4	6 59 27.2	+ 1 33.8	9.609 1809	9.858 1974	9.863 6868
10	324 15 18.7	3 45 13.8	3 08.2	6 57 00.2	3 21.6	9.603 4582	9.869 2259	9.874 8092
11	328 03 36.3	+ 3 51 25.2	− 4 45.4	− 6 52 41.4	+ 5 17.4	9.597 5055	9.880 4316	9.886 0876
12	331 58 16.5	3 57 59.0	6 20.1	6 46 22.6	7 21.7	9.591 3373	9.891 7723	9.897 4806
13	335 59 41.8	4 04 55.3	7 50.2	6 37 55.2	9 34.6	9.584 9705	9.903 2076	9.908 9485
14	340 08 14.6	4 12 14.0	9 13.4	6 27 10.6	11 56.1	9.578 4268	9.914 6986	9.920 4533
15	344 24 17.1	4 19 54.6	10 27.0	6 14 00.2	14 26.1	9.571 7323	9.926 2081	9.931 9582
16	348 48 10.5	+ 4 27 56.0	− 11 28.5	− 5 58 15.7	+ 17 04.3	9.564 9177	9.937 6994	9.943 4273
17	353 20 15.1	4 36 16.7	12 15.0	5 39 49.2	19 49.9	9.558 0202	9.949 1374	9.954 8254
18	358 00 49.6	4 44 54.5	12 43.7	5 18 34.0	22 41.4	9.551 0828	9.960 4870	9.966 1176
19	2 50 09.2	4 53 46.4	12 52.1	4 54 25.0	25 37.2	9.544 1558	9.971 7132	9.977 2695
20	7 48 26.1	5 02 48.6	12 37.9	4 27 19.0	28 34.9	9.537 2964	9.982 7822	9.988 2468
21	12 55 48.7	+ 5 11 56.2	− 11 59.5	− 3 57 15.6	+ 31 31.4	9.530 5694	9.993 6590	9.999 0144
22	18 12 18.4	5 21 03.2	10 55.8	3 24 17.9	34 22.8	9.524 0465	0.004 3088	0.009 5380
23	23 37 52.2	5 30 02.5	9 27.1	2 48 33.2	37 04.6	9.517 8059	0.014 6975	0.019 7830
24	29 12 18.1	5 38 46.0	7 34.7	2 10 13.7	39 31.5	9.511 9306	0.024 7903	0.029 7149
25	34 55 15.7	5 47 04.2	5 21.5	1 29 37.0	41 37.9	9.506 5076	0.034 5528	0.039 3000
26	40 46 14.7	+ 5 54 47.1	− 2 51.9	− 0 47 06.6	+ 43 18.0	9.501 6250	0.043 9524	0.048 5059
27	46 44 34.8	6 01 44.5	− 0 11.7	− 0 03 11.6	44 26.0	9.497 3687	0.052 9569	0.057 3015
28	52 49 25.0	6 07 45.5	+ 2 31.8	+ 0 41 33.1	44 56.8	9.493 8192	0.061 5366	0.065 6585
29	58 59 43.6	6 12 39.8	5 10.7	1 26 28.4	44 46.6	9.491 0476	0.069 6646	0.073 5516
30	65 14 19.3	6 16 18.3	7 36.6	2 10 51.9	43 52.9	9.489 1126	0.077 3174	0.080 9594
31	71 31 52.5	+ 6 18 33.7	+ 9 41.7	+ 2 53 59.6	+ 42 15.2	9.488 0562	0.084 4757	0.087 8646
Aug. 1	77 50 57.2	6 19 20.6	11 18.9	3 35 08.3	39 55.2	9.487 9025	0.091 1252	0.094 2558
2	84 10 03.4	6 18 36.6	12 23.0	4 13 37.2	36 56.6	9.488 6543	0.097 2564	0.100 1260
3	90 27 40.3	6 16 22.2	12 51.0	4 48 50.6	33 25.1	9.490 2955	0.102 8653	0.105 4741
4	96 42 18.8	6 12 40.7	12 42.2	5 20 18.7	29 27.3	9.492 7893	0.107 9535	0.110 3041
5	102 52 34.7	+ 6 07 38.3	+ 11 58.0	+ 5 47 39.2	+ 25 11.3	9.496 0828	0.112 5274	0.114 6245
6	108 57 11.2	6 01 23.5	10 42.2	6 10 37.9	20 45.1	9.500 1083	0.116 5975	0.118 4481
7	114 55 01.0	5 54 06.8	9 00.0	6 29 08.4	16 16.1	9.504 7881	0.120 1788	0.121 7917
8	120 45 07.4	5 45 58.7	6 57.6	6 43 11.3	11 51.1	9.510 0376	0.123 2894	0.124 6745
9	126 26 45.3	5 37 11.6	4 41.6	6 52 53.9	7 36.2	9.515 7694	0.125 9497	0.127 1178
10	131 59 21.3	+ 5 27 56.5	+ 2 18.6	+ 6 58 28.3	+ 3 35.4	9.521 8959	0.128 1817	0.129 1442
11	137 22 32.6	5 18 24.1	− 0 05.3	7 00 10.4	− 0 08.0	9.528 3322	0.130 0082	0.130 7765
12	142 36 07.0	5 08 44.1	2 24.8	6 58 18.7	3 31.9	9.534 9985	0.131 4522	0.132 0382
13	147 40 01.1	4 59 04.8	4 35.5	6 53 13.3	6 35.5	9.541 8208	0.132 5372	0.132 9521
14	152 34 19.2	4 49 33.0	6 34.0	6 45 14.4	9 18.7	9.548 7315	0.133 2855	0.133 5401
15	157 19 11.6	+ 4 40 14.5	− 8 17.9	+ 6 34 42.5	− 11 41.9	9.555 6713	0.133 7184	0.133 8230
16	161 54 54.1	+ 4 31 13.7	− 9 45.6	+ 6 21 56.9	− 13 46.2	9.562 5875	0.133 8562	0.133 8207

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Aug. 16	161 54 54.1	+ 4 31 13.7	− 9 45.6	+ 6 21 56.9	− 13 46.2	9.562 5875	0.133 8562	0.133 8207
17	166 21 46.0	4 22 33.8	10 56.3	6 07 15.9	15 32.9	9.569 4347	0.133 7184	0.133 5515
18	170 40 09.5	4 14 17.3	11 49.7	5 50 56.5	17 03.4	9.576 1736	0.133 3221	0.133 0322
19	174 50 28.8	4 06 25.5	12 26.4	5 33 13.9	18 19.3	9.582 7715	0.132 6836	0.132 2782
20	178 53 09.0	3 58 59.2	12 45.8	5 14 22.2	19 22.1	9.589 2007	0.131 8176	0.131 3036
21	182 48 35.9	+ 3 51 58.9	− 12 52.1	+ 4 54 33.5	− 20 13.3	9.595 4383	0.130 7375	0.130 1207
22	186 37 15.4	3 45 24.4	12 43.4	4 33 59.0	20 54.2	9.601 4657	0.129 4552	0.128 7415
23	190 19 33.2	3 39 15.4	12 22.0	4 12 48.1	21 25.1	9.607 2678	0.127 9811	0.127 1751
24	193 55 54.5	3 33 31.2	11 49.2	3 51 09.4	21 50.1	9.612 8325	0.126 3245	0.125 4303
25	197 26 43.6	3 28 11.0	11 06.4	3 29 10.1	22 07.4	9.618 1506	0.124 4935	0.123 5149
26	200 52 24.2	+ 3 23 14.0	− 10 14.9	+ 3 05 56.5	− 22 18.8	9.623 2146	0.122 4953	0.121 4353
27	204 13 19.0	3 18 39.2	9 16.1	2 44 34.2	22 25.0	9.628 0193	0.120 3357	0.119 1971
28	207 29 49.7	3 14 25.6	8 11.2	2 22 07.9	22 26.9	9.632 5608	0.118 0199	0.116 8045
29	210 42 17.1	3 10 32.6	7 01.3	1 59 41.6	22 25.1	9.636 8362	0.115 5515	0.114 2614
30	213 51 01.3	3 06 58.9	5 47.6	1 37 18.8	22 19.9	9.640 8442	0.112 9345	0.111 5709
31	216 56 21.1	+ 3 03 43.8	− 4 31.1	+ 1 15 02.7	− 22 11.9	9.644 5835	0.110 1709	0.108 7348
Sept. 1	219 58 34.8	3 00 46.4	3 12.8	0 52 55.8	22 01.5	9.648 0541	0.107 2627	0.105 7548
2	222 57 59.6	2 58 06.0	1 53.5	0 31 00.4	21 49.0	9.651 2559	0.104 2110	0.102 6316
3	225 54 52.2	2 55 41.8	− 0 34.2	+ 0 09 18.5	21 34.6	9.654 1897	0.101 0164	0.099 3655
4	228 49 28.4	2 53 33.2	+ 0 44.5	− 0 12 08.2	21 18.5	9.656 8561	0.097 6788	0.095 9562
5	231 42 03.6	+ 2 51 39.6	+ 2 01.9	− 0 33 18.1	− 21 01.1	9.659 2560	0.094 1976	0.092 4031
6	234 32 52.4	2 50 00.4	3 17.2	0 54 09.9	20 42.3	9.661 3904	0.090 5721	0.088 7046
7	237 22 09.1	2 48 35.2	4 29.9	1 14 42.3	20 22.3	9.663 2602	0.086 8002	0.084 8588
8	240 10 07.4	2 47 23.6	5 39.4	1 34 54.2	20 01.2	9.664 8666	0.082 8800	0.080 8636
9	242 57 00.7	2 46 25.2	6 45.3	1 54 44.4	19 39.0	9.666 2104	0.078 8093	0.076 7166
10	245 43 02.0	+ 2 45 39.6	+ 7 47.0	− 2 14 11.9	− 19 15.8	9.667 2924	0.074 5852	0.072 4145
11	248 28 24.1	2 45 06.7	8 44.1	2 33 15.7	18 51.6	9.668 1132	0.070 2042	0.067 9537
12	251 13 19.5	2 44 46.2	9 35.1	2 51 54.7	18 26.2	9.668 6734	0.065 6626	0.063 3305
13	253 58 00.7	2 44 38.1	10 22.8	3 10 07.8	17 59.8	9.668 9733	0.060 9568	0.058 5409
14	256 42 39.8	2 44 42.2	11 03.7	3 27 54.0	17 32.3	9.669 0131	0.056 0821	0.053 5800
15	259 27 29.2	+ 2 44 58.5	+ 11 38.5	− 3 45 12.0	− 17 03.5	9.668 7931	0.051 0339	0.048 4431
16	262 12 40.9	2 45 27.0	12 06.9	4 02 00.6	16 33.5	9.668 3130	0.045 8072	0.043 1256
17	264 58 27.3	2 46 07.8	12 28.7	4 18 18.5	16 02.1	9.667 5725	0.040 3976	0.037 6223
18	267 45 00.7	2 47 01.0	12 43.5	4 34 04.2	15 29.1	9.666 5710	0.034 7992	0.031 9275
19	270 32 33.5	2 48 06.8	12 51.2	4 49 16.2	14 54.5	9.665 3078	0.029 0066	0.026 0359
20	273 21 18.6	+ 2 49 25.4	+ 12 51.5	− 5 03 52.5	− 14 17.8	9.663 7823	0.023 0146	0.019 9421
21	276 11 28.7	2 50 57.0	12 44.3	5 17 51.2	13 39.3	9.661 9936	0.016 8177	0.013 6408
22	279 03 17.1	2 52 42.1	12 29.4	5 31 10.3	12 58.5	9.659 9408	0.010 4107	0.007 1268
23	281 56 57.4	2 54 40.8	12 06.9	5 43 47.4	12 15.3	9.657 6228	0.003 7886	0.000 3956
24	284 52 43.5	2 56 53.7	11 36.5	5 55 39.9	11 29.3	9.655 0386	9.996 9472	9.993 4429
25	287 50 49.8	+ 2 59 21.4	+ 10 58.3	− 6 06 44.9	− 10 40.2	9.652 1872	9.989 8825	9.986 2655
26	290 51 31.3	3 02 04.2	10 12.4	6 16 59.2	9 47.8	9.649 0680	9.982 5918	9.978 8612
27	293 53 03.4	3 05 02.6	9 18.9	6 26 19.3	8 51.8	9.645 6800	9.975 0740	9.971 2300
28	297 01 42.0	3 08 17.4	8 18.1	6 34 41.5	7 51.8	9.642 0234	9.967 3298	9.963 3734
29	300 11 44.0	3 11 49.3	7 10.1	6 42 01.4	6 47.3	9.638 0982	9.959 3618	9.955 2957
30	303 25 26.4	+ 3 15 38.8	+ 5 55.5	6 48 14.5	− 5 38.0	9.633 9050	9.951 1761	9.947 0044
Oct. 1	306 43 07.5	+ 3 19 46.5	+ 4 34.8	− 6 53 15.7	− 4 23.5	9.629 4452	9.942 7824	9.938 5119

MERCURY.

GREENWICH MEAN NOON

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 1	306 43 07.5	+ 3 19.46.5	+ 4 34.8	− 6 53 15.7	− 4 23.5	9.629 4452	9.942 7824	9.938 5119
2	310 05 05.7	3 24 13.2	3 08.6	6 56 59.5	3 03.1	9.624 7213	9.934 1954	9.929 8355
3	313 31 40.6	3 28 59.9	1 37.8	6 59 19.9	1 36.7	9.619 7366	9.925 4358	9.920 9996
4	317 03 12.5	3 34 07.0	+ 0 03.4	7 00 10.5	− 0 03.4	9.614 4962	9.916 5313	9.912 0358
5	320 40 01.6	3 39 35.2	− 1 33.5	6 59 24.3	+ 1 37.0	9.609 0067	9.907 5188	9.902 9864
6	324 22 29.9	+ 3 45 25.1	− 3 11.3	− 6 56 53.9	+ 3 25.0	9.603 2768	9.898 4457	9.893 9046
7	328 10 59.1	3 51 37.1	4 48.4	6 52 31.5	5 21.2	9.597 3173	9.889 3721	9.884 8577
8	332 05 51.6	3 58 11.6	6 23.0	6 46 08.7	7 25.7	9.591 1426	9.880 3724	9.875 9278
9	336 07 29.8	4 05 08.6	7 52.9	6 37 37.2	9 38.8	9.584 7700	9.871 5373	9.867 2152
10	340 16 16.3	4 12 28.0	9 15.8	6 26 48.2	12 00.6	9.578 2215	9.862 9769	9.858 8388
11	344 32 33.1	+ 4 20 09.2	− 10 29.1	− 6 13 33.1	+ 14 30.9	9.571 5229	9.854 8191	9.850 9368
12	348 56 41.6	4 28 11.2	11 30.1	5 57 43.7	17 09.3	9.564 7053	9.847 2123	9.843 6668
13	353 29 01.9	4 36 32.5	12 16.1	5 39 12.1	19 55.0	9.557 8061	9.840 3225	9.837 2025
14	358 09 52.3	4 45 10.8	12 44.3	5 17 51.6	22 47.0	9.550 8685	9.834 3304	9.831 7302
15	2 59 28.2	4 54 03.0	12 52.0	4 53 36.9	25 42.7	9.543 9428	9.829 4258	9.827 4405
16	7 58 01.8	+ 5 03 05.5	− 12 37.1	− 4 26 25.6	+ 28 40.2	9.537 0866	9.825 7973	9.824 5180
17	13 05 41.0	5 12 13.2	11 57.9	3 56 16.8	31 36.9	9.530 3652	9.823 6224	9.823 1288
18	18 22 27.9	5 21 20.0	10 53.4	3 23 13.7	34 28.1	9.523 8501	9.823 0529	9.823 4078
19	23 48 18.3	5 30 18.9	9 23.9	2 47 24.0	37 09.4	9.517 6195	9.824 2028	9.825 4439
20	29 23 00.3	5 39 01.6	7 30.8	2 08 59.9	39 35.8	9.511 7572	9.827 1338	9.829 2712
21	35 06 13.0	+ 5 47 18.9	− 5 17.0	− 1 28 19.3	+ 41 41.4	9.506 3500	9.831 8504	9.834 8618
22	40 57 26.2	5 55 00.7	2 47.0	0 45 45.9	43 20.5	9.501 4859	9.838 2922	9.842 1255
23	46 55 59.0	6 01 56.3	− 0 06.7	− 0 01 48.9	44 27.5	9.497 2504	9.846 3415	9.850 9177
24	53 01 00.0	6 07 55.3	+ 2 36.8	+ 0 42 56.8	44 57.5	9.493 7241	9.855 8289	9.861 0481
25	59 11 27.4	6 12 47.4	5 15.5	1 27 51.7	44 45.9	9.490 9778	9.866 5468	9.872 2957
26	65 26 09.5	+ 6 16 23.5	+ 7 40.9	+ 2 12 13.4	+ 43 50.5	9.489 0695	9.878 2650	9.884 4247
27	71 43 46.6	6 18 36.2	9 45.1	2 55 18.1	42 11.4	9.488 0410	9.890 7451	9.897 1973
28	78 02 52.4	6 19 20.4	11 21.4	3 36 22.4	39 50.2	9.487 9151	9 90.3 7535	9.910 3868
29	84 21 57.0	6 18 33.6	12 24.4	4 14 45.8	36 50.5	9.488 6950	9.917 0722	9.923 7858
30	90 39 29.3	6 16 16.2	12 51.3	4 49 52.5	33 18.0	9.490 3631	9.930 5058	9.937 2119
31	96 54 00.6	+ 6 12 32.1	+ 12 41.3	+ 5 21 13.2	+ 29 19.7	9.492 8823	9.943 8857	9.950 5105
Nov. 1	103 04 06.8	6 07 27.5	11 56.1	5 48 25.8	25 03.2	9.496 1992	9.957 0716	9.963 5561
2	109 08 31.5	6 01 10.7	10 39.5	6 11 16.3	20 36.7	9.500 2461	9.9'.9 9520	9.976 2492
3	115 06 07.5	5 53 52.0	8 56.5	6 29 38.4	16 07.8	9.504 9447	9.982 4392	9.988 5150
4	120 55 58.6	5 45 42.8	6 53.5	6 43 33.2	11 43.1	9.510 2103	9.994 4705	0.000 3008
5	126 37 20.1	+ 5 36 54.7	+ 4 37.2	+ 6 53 07.9	+ 7 28.4	9.515 9554	0.006 0022	0.011 5719
6	132 09 38.7	5 27 38.9	+ 2 14.1	6 58 34.8	+ 3 28.2	9.522 0925	0.017 0076	0.022 3081
7	137 32 32.2	5 18 06.2	− 0 09.7	7 00 10.1	− 0 14.6	9.528 5369	0.027 4728	0.032 5018
8	142 45 48.6	5 08 26.1	2 29.0	6 58 12.1	3 37.9	9.535 2087	0.037 3954	0.042 1546
9	147 49 24.7	4 58 46.9	4 39.4	6 53 01.0	6 40.8	9.542 0344	0.046 7805	0.051 2748
10	152 43 25.0	+ 4 49 15.5	· 6 37.5	+ 6 44 57.2	− 9 23.4	9.548 9468	0.055 6393	0.059 8762
11	157 28 00.2	4 39 57.5	8 20.9	6 34 20.8	11 46.0	9.555 8864	0.063 9877	0.067 9760
12	162 03 25.9	4 30 57.3	9 48.0	6 21 31.4	13 49.7	9.562 8010	0.071 8439	0.075 5938
13	166 30 01.8	4 22 18.2	10 58.2	6 06 47.2	15 35.9	9.569 6452	0.079 2285	0.082 7505
14	170 48 10.0	4 14 02.2	11 51.1	5 50 25.0	17 06.0	9.576 3801	0.086 1626	0.089 4674
15	174 58 14.6	+ 4 06 11.2	− 12 27.2	+ 5 32 40.0	− 18 21.5	9.582 9731	0.092 6675	0.095 7656
16	179 00 41.0	+ 3 58 45.9	12 47.2	+ 5 13 46.3	− 19 23.9	9.589 3965	0.098 7642	0.101 6661

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth — At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Nov. 16	179 00 41.0	+ 3 58 45.9	− 12 47.2	+ 5 13 46.3	− 19 23.9	9.58 1 3965	0.098 7642	0.101 6661
17	182 55 55.0	3 51 46.4	12 52.1	4 53 56.1	20 14.7	9.595 6276	0.104 4736	0.107 1891
18	186 44 22.4	3 45 12.7	12 43.0	4 33 20.3	20 55.3	9.601 6481	0.109 8151	0.112 3540
19	190 26 28.9	3 39 04.5	12 21.2	4 12 08.5	21 27.0	9.607 4429	0.111 8079	0.117 1790
20	194 02 39.6	3 33 21.0	11 48.0	3 50 29.0	21 50.8	9.613 0001	0.119 4693	0.121 6811
21	197 33 18.9	+ 3 28 01.5	− 11 04.9	+ 3 28 29.2	− 22 07.8	9.618 3104	0.123 8162	0.125 8766
22	200 58 50.4	3 23 05.3	10 13.2	3 06 15.3	22 19.1	9.623 3663	0.127 8640	0.129 7803
23	204 19 36.8	3 18 31.2	9 14.2	2 43 52.7	22 25.2	9.628 1628	0.131 6271	0.133 4060
24	207 35 59.8	3 14 18.3	8 09.1	2 21 26.3	22 26.9	9.632 6961	0.135 1186	0.136 7666
25	210 48 20.1	3 10 25.8	6 59.1	1 59 00.1	22 24.9	9.636 9632	0.138 3513	0.139 8739
26	213 56 57.8	+ 3 06 52.7	− 5 45.3	+ 1 36 37.5	− 22 19.7	9.640 9627	0.141 3358	0.142 7383
27	217 02 11.7	3 03 38.1	4 28.7	1 14 21.6	22 11.7	9.644 6937	0.144 0833	0.145 3708
28	220 04 19.9	3 00 41.3	3 10.3	0 52 15.0	22 01.1	9.648 1559	0.146 6024	0.147 7793
29	223 03 39.9	2 58 01.4	1 51.1	0 30 20.0	21 48.6	9.651 3496	0.148 9022	0.149 9721
30	226 00 28.1	2 55 37.6	− 0 31.7	+ 0 08 38.5	21 34.1	9.654 2749	0.150 9899	0.151 9567
Dec. 1	228 55 00.4	+ 2 53 29.6	+ 0 47.0	− 0 12 47.7	− 21 18.0	9.656 9331	0.152 8732	0.153 7401
2	231 47 32.2	2 51 36.4	2 04.2	0 33 57.1	21 00.5	9.659 3247	0.154 5580	0.155 3278
3	234 38 18.0	2 49 57.7	3 19.5	0 54 48.3	20 41.7	9.661 4509	0.156 0499	0.156 7251
4	237 27 32.2	2 48 32.9	4 32.1	1 15 20.1	20 21.6	9.663 3127	0.157 3538	0.157 9366
5	240 15 28.4	2 47 21.7	5 41.6	1 35 31.2	20 00.5	9.664 9109	0.158 4740	0.158 9664
6	243 02 20.0	+ 2 46 23.7	+ 6 47.3	− 1 55 20.9	− 19 38.4	9.666 2468	0.159 4142	0.159 8177
7	245 48 19.9	2 45 38.4	7 48.8	2 14 47.7	19 15.1	9.667 3208	0.160 1773	0.160 4937
8	248 33 41.1	2 45 06.0	8 45.8	2 33 50.7	18 50.8	9.668 1335	0.160 7667	0.160 9964
9	251 18 36.0	2 44 45.9	9 37.7	2 52 28.9	18 25.5	9.668 6857	0.161 1830	0.161 3269
10	254 03 17.0	2 44 38.2	10 24.1	3 10 41.3	17 59.0	9.668 9778	0.161 4283	0.161 4873
11	256 47 56.4	+ 2 44 42.6	+ 11 04.8	− 3 28 26.6	− 17 31.4	9.669 0100	0.161 5039	0.161 4781
12	259 32 46.3	2 44 59.3	11 39.5	3 45 43.7	17 02.6	9.668 7822	0.161 4098	0.161 2990
13	262 17 59.0	2 45 28.2	12 07.7	4 02 31.4	16 32.6	9.668 2941	0.161 1457	0.160 9498
14	265 03 46.7	2 46 09.3	12 29.2	4 18 48.4	16 01.1	9.667 5457	0.160 7112	0.160 4297
15	267 50 21.7	2 47 02.9	12 43.8	4 34 33.1	15 28.0	9.666 5363	0.160 1051	0.159 7370
16	270 37 56.7	+ 2 48 09.1	+ 12 51.3	− 4 49 43.9	− 14 53.2	9.665 2653	0.159 3252	0.158 8695
17	273 26 44.2	2 49 28.0	12 51.4	5 04 19.0	14 16.7	9.663 7321	0.158 3696	0.157 8249
18	276 16 57.1	2 51 00.1	12 44.0	5 18 16.6	13 38.1	9.661 9354	0.157 2349	0.156 5993
19	279 08 48.8	2 52 45.5	12 28.9	5 31 34.5	12 57.2	9.659 8747	0.155 9174	0.155 1889
20	282 02 32.7	2 54 44.7	12 06.0	5 44 10.2	12 13.9	9.657 5487	0.154 4130	0.153 5893
21	284 58 22.9	+ 2 56 58.0	+ 11 35.4	− 5 56 01.3	− 11 27.8	9.654 9565	0.152 7170	0.151 7953
22	287 56 33.7	2 59 26.1	10 57.0	6 07 04.7	10 38.6	9.652 0973	0.150 8235	0.149 8008
23	290 57 20.2	3 02 09.4	10 10.9	6 17 17.4	9 46.2	9.648 9701	0.148 7263	0.147 5992
24	294 00 57.7	3 05 08.3	9 17.2	6 26 35.8	8 50.0	9.645 5744	0.146 4184	0.145 1830
25	297 07 42.3	3 08 23.6	8 16.1	6 34 56.0	7 49.8	9.641 9100	0.143 8918	0.142 5438
26	300 17 50.6	+ 3 11 55.8	+ 7 07.9	− 6 42 14.0	− 6 45.3	9.637 9707	0.141 1378	0.139 6727
27	303 31 39.9	3 15 45.6	5 53.1	6 48 24.9	5 35.8	9.633 7757	0.138 1470	0.136 5595
28	306 49 28.4	3 19 54.2	4 32.2	6 53 23.8	4 21.1	9.629 3081	0.134 9087	0.133 1031
29	310 11 34.7	3 24 21.6	3 05.8	6 57 05.1	3 00.6	9.624 5763	0.131 4112	0.129 5617
30	313 38 18.2	3 29 08.8	1 34.9	6 59 22.9	1 33.9	9.619 5842	0.127 6426	0.125 6523
31	317 09 59.1	+ 3 34 16.5	+ 0 00.4	− 7 00 10.6	− 0 00.4	9.614 3367	0.123 5888	0.121 4504
32	320 46 58.2	+ 3 39 45.3	− 1 36.5	− 6 59 21.3	+ 1 40.2	9.608 8401	0.119 2351	

VENUS.

GREENWICH MEAN NOON

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 0	71 41 38.0	+ 1 36 39.2	− 0 25.9	− 0 14 36.1	+ 5 43.0	9.857 7775	9.679 4522	9.673 0361
2	74 55 00.0	1 36 42.8	− 0 05.6	− 0 03 08.9	5 44.1	9.857 6377	9.666 5647	9.660 0388
4	78 08 29.2	1 36 46.4	+ 0 14.8	+ 0 08 19.4	5 44.0	9.857 5032	9.653 4605	9.646 8318
6	81 22 05.7	1 36 50.1	0 35.0	0 19 46.5	5 42.8	9.857 3745	9.640 1548	9.633 4317
8	84 35 49.4	1 36 53.6	0 54.8	0 31 10.2	5 40.6	9.857 2518	9.626 6654	9.619 8590
10	87 49 40.2	+ 1 36 57.1	+ 1 13.9	+ 0 42 28.4	+ 5 37.3	9.857 1357	9.613 0174	9.606 1440
12	91 03 38.0	1 37 00.6	1 32.0	0 53 38.8	5 32.9	9.857 0266	9.599 2438	9.592 3223
14	94 17 42.5	1 37 04.0	1 49.0	1 04 39.3	5 27.4	9.856 9247	9.585 3853	9.578 4401
16	97 31 53.8	1 37 07.3	2 04.6	1 15 27.7	5 20.9	9.856 8305	9.571 4944	9.564 5573
18	100 46 11.5	1 37 10.4	2 18.6	1 26 01.9	5 13.3	9.856 7442	9.557 6384	9.550 7474
20	104 00 35.4	+ 1 37 13.4	+ 2 30.9	+ 1 36 19.9	+ 5 04.6	9.856 6662	9.543 8972	9.537 1008
22	107 15 05.2	1 37 16.3	2 41.2	1 46 19.6	4 55.0	9.856 5966	9.530 3715	9.523 7233
24	110 29 40.5	1 37 19.0	2 49.5	1 55 59.1	4 44.4	9.856 5358	9.517 1725	9.510 7362
26	113 44 21.1	1 37 21.5	2 55.6	2 05 16.4	4 32.8	9.856 4839	9.504 4317	9.498 2774
28	116 59 06.5	1 37 23.8	2 59.4	2 14 09.8	4 20.4	9.856 4411	9.492 2928	9.486 4982
30	120 13 56.3	+ 1 37 25.9	+ 3 01.0	+ 2 22 37.5	+ 4 07.1	9.856 4075	9.480 9143	9.475 5623
Feb. 1	123 28 49.9	1 37 27.7	3 00.2	2 30 37.7	3 53.0	9.856 3833	9.470 4639	9.465 6412
3	126 43 46.9	1 37 29.2	2 57.1	2 38 09.0	3 38.2	9.856 3685	9.461 1162	9.456 9110
5	129 58 46.7	1 37 30.5	2 51.8	2 45 09.9	3 22.6	9.856 3633	9.453 0462	9.449 5431
7	133 13 48.8	1 37 31.5	2 44.2	2 51 38.9	3 06.3	9.856 3675	9.446 4207	9.443 6969
9	136 28 52.5	+ 1 37 32.1	+ 2 34.5	+ 2 57 34.8	+ 2 49.5	9.856 3813	9.441 3881	9.439 5088
11	139 43 57.2	1 37 32.5	2 22.8	3 02 56.4	2 32.3	9.856 4045	9.438 0718	9.437 0876
13	142 59 02.2	1 37 32.5	2 09.3	3 07 42.8	2 14.4	9.856 4371	9.436 5629	9.436 5019
15	146 14 06.8	1 37 32.1	1 54.1	3 11 52.9	1 55.8	9.856 4790	9.436 9066	9.437 7761
17	149 29 10.5	1 37 31.4	1 37.5	3 15 25.9	1 37.1	9.856 5300	9.439 1060	9.440 8892
19	152 44 12.3	+ 1 37 30.4	+ 1 19.7	+ 3 18 21.3	+ 1 18.1	9.856 5899	9.443 1156	9.445 7725
21	155 59 11.8	1 37 29.0	1 00.8	3 20 38.4	0 58.9	9.856 6586	9.448 8447	9.452 3147
23	159 14 08.1	1 37 27.2	0 41.1	3 22 16.8	0 39.5	9.856 7359	9.456 1632	9.460 3690
25	162 29 00.5	1 37 25.1	0 20.9	3 23 16.3	0 20.0	9.856 8215	9.464 9123	9.469 7686
27	165 43 48.3	1 37 22.7	+ 0 00.4	3 23 36.7	+ 0 00.4	9.856 9150	9.474 9155	9.480 3298
Mar. 1	168 58 30.9	+ 1 37 19.8	− 0 20.0	+ 3 23 18.0	− 0 19.1	9.857 0162	9.485 9887	9.491 8097
3	172 13 07.6	1 37 16.7	0 40.2	3 22 20.3	0 38.6	9.857 1247	9.497 9508	9.504 2107
5	175 27 37.8	1 37 13.3	0 59.8	3 20 43.9	0 57.8	9.857 2402	9.510 6295	9.517 1881
7	178 42 00.8	1 37 09.6	1 18.7	3 18 29.1	1 16.9	9.857 3623	9.523 8681	9.530 6510
9	181 56 16.1	1 37 05.6	1 36.6	3 15 36.4	1 35.7	9.857 4906	9.537 5238	9.544 4691
11	185 10 23.1	+ 1 37 01.3	− 1 53.2	+ 3 12 06.5	· 1 54.1	9.857 6247	9.551 4742	9.558 5264
13	188 24 21.3	1 36 56.8	2 08.4	3 08 00.1	2 12.2	9.857 7641	9.565 6145	9.572 7282
15	191 38 10.3	1 36 52.1	2 21.9	3 03 18.0	2 29.8	9.857 9085	9.579 8578	9.586 9945
17	194 51 49.6	1 36 47.2	2 33.6	2 58 01.3	2 46.8	9.858 0572	9.594 1305	9.601 2584
19	198 05 18.9	1 36 42.1	2 43.4	2 52 11.1	3 03.3	9.858 2099	9.608 3717	9.615 4643
21	201 18 37.8	+ 1 36 36.9	− 2 51.1	+ 2 45 48.5	− 3 19.2	9.858 3660	9.622 5306	9.629 5652
23	204 31 46.2	1 36 31.5	2 56.7	2 38 54.7	3 34.4	9.858 5251	9.636 5630	9.643 5227
25	207 44 43.8	1 36 26.1	3 00.0	2 31 31.3	3 48.9	9.858 6866	9.650 4377	9.657 3053
27	210 57 30.5	1 36 20.6	3 01.0	2 23 39.7	4 02.6	9.858 8501	9.664 1226	9.670 8870
29	214 10 06.2	1 36 15.1	2 59.8	2 15 21.4	4 15.6	9.859 0149	9.677 5964	9.684 2486
31	217 22 30.8	+ 1 36 09.5	− 2 56.3	+ 2 06 38.0	− 4 27.7	9.859 1806	9.690 8423	9.697 3762
Apr. 2	220 34 44.3	+ 1 36 04.0	− 2 50.6	+ 1 57 31.3	4 38.9	9.859 3467	9.703 8480	9.710 2595

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr. 2	220 34 44.3	+ 1 36 04.0	− 2 50.6	+ 1 57 31.3	− 4 38.9	9.859 3467	9.703 8489	9.710 2595
4	223 46 46.9	1 35 58.6	2 42.8	1 48 03.0	4 49.2	9.859 5126	9.716 6071	9.722 8912
6	226 58 38.7	1 35 53.2	2 33.0	1 38 15.0	4 58.6	9.859 6778	9.729 1115	9.735 2678
8	230 10 19.9	1 35 48.0	2 21.3	1 28 09.1	5 07.1	9.859 8418	9.741 3603	9.747 3889
10	233 21 50.7	1 35 42.9	2 07.8	1 17 47.2	5 14.6	9.860 0041	9.753 3542	9 759 2565
12	236 33 11.4	+ 1 35 37.9	− 1 52.8	+ 1 07 11.3	− 5 21.1	9.860 1642	9.765 0964	9.770 8743
14	239 44 22.3	1 35 33.1	1 36.3	0 56 23.5	5 26.6	9.860 3216	9.776 5909	9.782 2369
16	242 55 23.8	1 35 28.4	1 18.7	0 45 25 6	5 31.1	9.860 4758	9.787 8427	9.793 3780
18	246 06 16.2	1 35 24.0	1 00.2	0 34 19.8	5 34.5	9.860 6264	9.798 8553	9.804 2734
20	249 17 00.1	1 35 19.7	0 40.9	0 23 08.2	5 37.0	9.860 7729	9.809 6333	9.814 9357
22	252 27 35.9	+ 1 35 15.9	− 0 21.1	+ 0 11 52.7	− 5 38.4	9.860 9148	9.820 1809	9.825 3692
24	255 38 04.1	1 35 12.3	− 0 01.1	+ 0 00 35.4	5 38.7	9.861 0518	9.830 5012	9.835 5774
26	258 48 25.2	1 35 08.9	+ 0 19.0	− 0 10 41.5	5 38.0	9.861 1833	9.840 5982	9.845 5641
28	261 58 39.8	1 35 05.7	0 38.8	0 21 56.1	5 36.3	9.861 3090	9.850 4757	9.855 3333
30	265 08 48.4	1 35 02.9	0 58.1	0 33 06.3	5 33.6	9.861 4286	9.860 1375	9.864 8891
May 2	268 18 51.6	+ 1 35 00.4	+ 1 16.6	− 0 44 10.0	− 5 29.9	9.861 5417	9.869 5883	9.874 2356
4	271 28 50.0	1 34 58.1	1 34.3	0 55 05.3	5 25.2	9.861 6478	9.878 8316	9.883 3769
6	274 38 44.2	1 34 56.1	1 50.7	1 05 50.3	5 19.5	9.861 7468	9.887 8723	9.892 3184
8	277 48 34.7	1 34 54.4	2 05.9	1 16 22.9	5 12.9	9.861 8384	9.896 7159	9.901 0557
10	280 58 22.1	1 34 53.0	2 19.4	1 26 41.3	5 05.3	9.861 9222	9.905 3684	9.909 6249
12	284 08 07.1	+ 1 34 52.0	+ 2 31.3	− 1 36 43.6	− 4 56.8	9.861 9980	9.913 8360	9.918 0023
14	287 17 50.1	1 34 51.1	2 41.3	1 46 28.1	4 47.5	9.862 0656	9.922 1246	9.926 2036
16	290 27 31.8	1 34 50.6	2 49.4	1 55 52.9	4 37.3	9.862 1248	9.930 2398	9.934 2347
18	293 37 12.6	1 34 50.3	2 55.4	2 04 56.5	4 26.2	9.862 1754	9.938 1858	9.942 0969
20	296 46 53.2	1 34 50.3	2 59.3	2 13 37.2	4 14.4	9.862 2173	9.945 9672	9.949 7971
22	299 56 34.1	+ 1 34 50.5	+ 3 00.9	− 2 21 53.4	− 4 01.8	9.862 2503	9.953 5871	9.957 3376
24	303 06 15.5	1 34 51.0	3 00.4	2 29 43.6	3 48.4	9.862 2743	9.961 0491	9.964 7218
26	306 15 58.2	1 34 51.7	2 57.7	2 37 06.5	3 34.4	9.862 2893	9.968 3562	9.971 9525
28	309 25 42.5	1 34 52.6	2 52.8	2 44 00.7	3 19.7	9.862 2953	9.975 5111	9.979 0323
30	312 35 28.8	1 34 53.7	2 45.8	2 50 25.0	3 04.5	9.862 2922	9.982 5163	9.985 9637
June 1	315 45 17.5	+ 1 34 55.0	+ 2 36.8	− 2 56 18.2	− 2 48.6	9.862 2800	9.989 3747	9.992 7495
3	318 55 09.1	1 34 56.5	2 25.9	3 01 39.3	2 32.3	9.862 2587	9.996 0885	9.999 3919
5	322 05 03.7	1 34 58.2	2 13.2	3 06 27.2	2 15.5	9.862 2285	0.002 6604	0.005 8945
7	325 15 01.8	1 35 00.0	1 58.9	3 10 41.0	1 58.3	9.862 1894	0.009 0946	0.012 2610
9	328 25 03.7	1 35 01.9	1 43.1	3 14 20.0	1 40.7	9.862 1415	0.015 3944	0.018 4952
11	331 35 09.5	+ 1 35 04.0	+ 1 26.1	−− 3 17 23.6	− 1 22.8	9.862 0850	0.021 5640	0.024 6012
13	334 45 19.6	1 35 06.1	1 08.2	3 19 51.0	1 04.6	9.862 0200	0.027 6072	0.030 5824
15	337 55 34.1	1 35 08.4	0 49.1	3 21 41.9	0 46.2	9.861 9467	0.033 5270	0.036 4415
17	341 05 53.3	1 35 10.8	0 29.6	3 22 55.8	0 27.7	9.861 8654	0.039 3261	0.042 1810
19	344 16 17.3	1 35 13.2	+ 0 09.7	3 23 32.5	− 0 09.0	9.861 7763	0.045 0067	0.047 8036
21	347 26 46.4	+ 1 35 15.8	− 0 10.4	3 23 31.8	+ 0 09.7	9.861 6795	0.050 5718	0.053 3113
23	350 37 20.6	1 35 18.4	0 30.3	3 22 53.7	0 28.4	9.861 5755	0.056 0223	0.058 7050
25	353 48 00.1	1 35 21.1	0 49.8	3 21 38.3	0 47.0	9.861 4646	0.061 3597	0.063 9866
27	356 58 45.0	1 35 23.8	1 08.8	3 19 45.7	1 05.6	9.861 3469	0.066 5859	0.069 1576
29	0 09 35.4	1 35 26.6	1 26.9	3 17 16.1	1 23.9	9.861 2230	0.071 7019	0.074 2189
July 1	3 20 31.4	+ 1 35 29.4	− 1 43.9	3 14 10.1	+ 1 42.1	9.861 0932	0.076 7087	0.079 1716
3	6 31 33.2	+ 1 35 32.3	− 1 59.7	− 3 10 28.1	+ 1 59.9	9.860 9579	0.081 6078	0.084 0175

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	3 20 31.4	+ 1 35 29.4	− 1 43.9	− 3 14 10.1	+ 1 42.1	9.861 0932	0.076 7087	0.079 1716
3	6 31 33.2	1 35 32.3	1 59.7	3 10 28.1	1 59.9	9.860 9579	0.081 6078	0.084 0175
5	9 42 40.7	1 35 35.2	2 14.0	3 06 10.7	2 17.4	9.860 8174	0.086 4010	0.088 7584
7	12 53 54.2	1 35 38.2	2 26.7	3 01 18.6	2 34.6	9.860 6723	0.091 0903	0.093 3969
9	16 05 13.6	1 35 41.2	2 37.6	2 55 52.7	2 51.2	9.860 5229	0.095 6784	0.097 9353
11	19 16 39.1	+ 1 35 44.3	− 2 46.5	− 2 49 54.0	+ 3 07.4	9.860 3696	0.100 1676	0.102 3760
13	22 28 10.6	1 35 47.4	2 53.4	2 43 23.5	3 23.0	9.860 2131	0.104 5606	0.106 7216
15	25 39 48.4	1 35 50.5	2 58.1	2 36 22.2	3 38.1	9.860 0537	0.108 8592	0.110 9733
17	28 51 32.5	1 35 53.6	3 00.6	2 28 51.5	3 52.5	9.859 8919	0.113 0645	0.115 1332
19	32 03 23.0	1 35 56.8	3 00.9	2 20 52.7	4 06.2	9.859 7282	0.117 1794	0.119 2029
21	35 15 20.0	+ 1 36 00.1	− 2 58.9	− 2 12 27.2	+ 4 19.1	9.859 5633	0.121 2040	0.123 1828
23	38 27 23.5	1 36 03.4	2 54.6	2 03 36.6	4 31.3	9.859 3974	0.125 1396	0.127 0743
25	41 39 33.6	1 36 06.7	2 48.2	1 54 22.4	4 42.7	9.859 2312	0.128 9871	0.130 8780
27	44 51 50.4	1 36 10.1	2 39.7	1 44 46.4	4 53.2	9.859 0652	0.132 7471	0.134 5944
29	48 04 14.1	1 36 13.5	2 29.2	1 34 50.2	5 02.8	9.858 9000	0.136 4200	0.138 2239
31	51 16 44.6	+ 1 36 17.0	− 2 16.8	− 1 24 35.8	+ 5 11.5	9.858 7359	0.140 0063	0.141 7672
Aug. 2	54 29 22.2	1 36 20.5	2 02.7	1 14 05.0	5 19.2	9.858 5736	0.143 5069	0.145 2254
4	57 42 06.7	1 36 24.1	1 47.0	1 03 19.7	5 25.9	9.858 4136	0.146 9230	0.148 5997
6	60 54 58.4	1 36 27.6	1 30.0	0 52 22.1	5 31.6	9.858 2563	0.150 2559	0.151 8919
8	64 07 57.3	1 36 31.2	1 11.8	0 41 14.1	5 36.3	9.858 1023	0.153 5078	0.155 1037
10	67 21 03.4	+ 1 36 34.8	− 0 52.7	− 0 29 57.8	+ 5 39.9	9.857 9521	0.156 6800	0.158 2368
12	70 34 16.7	1 36 38.5	0 32.9	0 18 35.4	5 42.4	9.857 8062	0.159 7744	0.161 2928
14	73 47 37.2	1 36 42.1	− 0 12.7	− 0 07 09.0	5 43.8	9.857 6650	0.162 7923	0.164 2730
16	77 01 05.0	1 36 45.7	+ 0 07.7	+ 0 04 19.2	5 44.2	9.857 5289	0.165 7351	0.167 1785
18	80 14 40.1	1 36 49.3	0 28.0	0 15 47.0	5 43.4	9.857 3985	0.168 6036	0.170 0106
20	83 28 22.3	+ 1 36 52.9	+ 0 47.9	+ 0 27 12.2	+ 5 41.6	9.857 2741	0.171 3993	0.172 7698
22	86 42 11.6	1 36 56.4	1 07.3	0 38 32.6	5 38.6	9.857 1562	0.174 1221	0.175 4565
24	89 56 07.9	1 36 59.9	1 25.8	0 49 46.0	5 34.6	9.857 0452	0.176 7729	0.178 0714
26	93 10 11.0	1 37 03.3	1 43.2	1 00 50.2	5 29.5	9.856 9413	0.179 3520	0.180 6146
28	96 24 20.9	1 37 06.5	1 59.3	1 11 43.1	5 23.3	9.856 8450	0.181 8594	0.183 0865
30	99 38 37.2	+ 1 37 09.7	+ 2 13.9	+ 1 22 22.6	+ 5 16.0	9.856 7566	0.184 2958	0.185 4872
Sept. 1	102 52 59.8	1 37 12.8	2 26.8	1 32 46.5	5 07.7	9.856 6764	0.186 6609	0.187 8172
3	106 07 28.3	1 37 15.7	2 37.8	1 42 52.8	4 58.4	9.856 6045	0.188 9563	0.190 0782
5	109 22 02.5	1 37 18.4	2 46.8	1 52 39.6	4 48.2	9.856 5413	0.191 1831	0.192 2712
7	112 36 42.0	1 37 20.9	2 53.7	2 02 04.9	4 37.0	9.856 4870	0.193 3425	0.194 3975
9	115 51 26.4	+ 1 37 23.4	+ 2 58.3	+ 2 11 06.8	+ 4 24.8	9.856 4418	0.195 4360	0.196 4585
11	119 06 15.3	1 37 25.5	3 00.7	2 19 43.6	4 11.8	9.856 4058	0.197 4649	0.198 4555
13	122 21 08.1	1 37 27.4	3 00.7	2 27 53.7	3 58.0	9.856 3791	0.199 4304	0.200 3896
15	125 36 04.5	1 37 29.0	2 58.4	2 35 35.2	3 43.4	9.856 3618	0.201 3335	0.202 2620
17	128 51 03.9	1 37 30.3	2 53.9	2 42 46.8	3 28.1	9.856 3540	0.203 1753	0.204 0734
19	132 06 05.6	+ 1 37 31.4	+ 2 47.1	+ 2 49 27.1	+ 3 12.1	9.856 3556	0.204 9564	0.205 8244
21	135 21 09.2	1 37 32.1	2 38.1	2 55 34.7	2 55.4	9.856 3668	0.206 6775	0.207 5156
23	138 36 13.9	1 37 32.5	2 27.1	3 01 08.4	2 38.2	9.856 3874	0.208 3388	0.209 1470
25	141 51 19.2	1 37 32.7	2 14.2	3 06 07.1	2 20.5	9.856 4174	0.209 9402	0.210 7185
27	145 06 24.3	1 37 32.4	1 59.6	3 10 29.9	2 02.3	9.856 4567	0.211 4820	0.212 2305
29	148 21 28.6	+ 1 37 31.8	+ 1 43.5	+ 3 14 16.0	+ 1 43.7	9.856 5052	0.212 9642	0.213 6832
Oct. 1	151 36 31.4	+ 1 37 30.9	+ 1 26.0	+ 3 17 24.5	+ 1 24.8	9.856 5626	0.214 3875	0.215 0773

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 1	151 36 31.4	+ 1 37 30.9	+ 1 26.0	+ 3 17 24.5	+ 1 24.8	9.856 5626	0.214 3875	0.215 0773
3	154 51 32.0	1 37 29.6	1 07.4	3 19 55.0	1 05.6	9.856 6289	0.215 7526	0.216 4136
5	158 06 29.6	1 37 28.0	0 48.0	3 21 47.0	0 46.3	9.856 7037	0.217 0605	0.217 6933
7	161 21 23.5	1 37 26.0	0 28.0	3 23 00.1	0 26.8	9.856 7869	0.218 3121	0.218 9172
9	164 36 13.1	1 37 23.6	+ 0 07.6	3 23 34.1	+ 0 07.2	9.856 8782	0.219 5088	0.220 0869
11	167 50 57.7	+ 1 37 20.9	− 0 12.9	+ 3 23 29.0	− 0 12.3	9.856 9773	0.220 6517	0.221 2032
13	171 05 36.6	1 37 17.9	0 33.2	3 22 44.9	0 31.8	9.857 0837	0.221 7417	0.222 2673
15	174 20 09.2	1 37 14.6	0 53.1	3 21 21.9	0 51.1	9.857 1973	0.222 7800	0.223 2800
17	177 34 34.8	1 37 11.0	1 12.2	3 19 20.4	1 10.3	9.857 3176	0.223 7673	0.224 2421
19	180 48 52.8	1 37 07.0	1 30.5	3 16 40.9	1 29.2	9.857 4442	0.224 7045	0.225 1544
21	184 03 02.7	+ 1 37 02.8	− 1 47.6	+ 3 13 23.9	− 1 47.8	9.857 5767	0.225 5918	0.226 0168
23	187 17 04.0	1 36 58.4	2 03.3	3 09 30.1	2 05.9	9.857 7147	0.226 4294	0.226 8295
25	190 30 56.2	1 36 53.7	2 17.4	3 05 00.4	2 23.7	9.857 8577	0.227 2171	0.227 5922
27	193 44 38.9	1 36 48.9	2 29.8	2 59 55.7	2 40.9	9.858 0053	0.227 9549	0.228 3051
29	196 58 11.6	1 36 43.8	2 40.2	2 54 17.0	2 57.6	9.858 1570	0.228 6429	0.228 9684
31	200 11 34.2	+ 1 36 38.7	− 2 48.7	+ 2 48 05.5	− 3 13.7	9.858 3123	0.229 2814	0.229 5826
Nov. 2	203 24 46.2	1 36 33.3	2 55.0	2 41 22.5	3 29.2	9.858 4707	0.229 8716	0.230 1485
4	206 37 47.5	1 36 27.9	2 59.1	2 34 09.3	3 43.9	9.858 6317	0.230 4134	0.230 6665
6	209 50 37.9	1 36 22.5	3 00.9	2 26 27.3	3 57.9	9.858 7948	0.230 9079	0.231 1378
8	213 03 17.2	1 36 16.9	3 00.5	2 18 18.2	4 11.1	9.858 9594	0.231 3563	0.231 5633
10	216 15 45.5	+ 1 36 11.4	− 2 57.8	+ 2 09 43.4	− 4 23.5	9.859 1252	0.231 7591	0.231 9437
12	219 28 02.8	1 36 05.9	2 52.8	2 00 44.6	4 35.1	9.859 2914	0.232 1173	0.232 2802
14	222 40 09.1	1 36 00.4	2 45.8	1 51 23.7	4 45.7	9.859 4577	0.232 4323	0.232 5736
16	225 52 04.5	1 35 55.0	2 36.6	1 41 42.3	4 55.5	9.859 6235	0.232 7042	0.232 8244
18	229 03 49.2	1 35 49.7	2 25.5	1 31 42.5	5 04.3	9.859 7882	0.232 9341	0.233 0332
20	232 15 23.4	+ 1 35 44.5	− 2 12.7	+ 1 21 26.0	− 5 12.1	9.859 9514	0.233 1216	0.233 1995
22	235 26 47.3	1 35 39.5	1 58.2	1 10 54.8	5 18.9	9.860 1125	0.233 2667	0.233 3231
24	238 38 01.4	1 35 34.6	1 42.2	1 00 10.9	5 24.8	9.860 2711	0.233 3688	0.233 4039
26	241 49 05.9	1 35 29.9	1 25.0	0 49 16.3	5 29.6	9.860 4267	0.233 4283	0.233 4420
28	245 00 01.2	1 35 25.4	1 06.7	0 38 13.1	5 33.4	9.860 5788	0.233 4449	0.233 4370
30	248 10 47.8	+ 1 35 21.2	− 0 47.6	+ 0 27 03.2	− 5 36.2	9.860 7269	0.233 4184	0.233 3891
Dec. 2	251 21 26.1	1 35 17.2	0 28.0	0 15 48.8	5 38.0	9.860 8706	0.233 3493	0.233 2990
4	254 31 56.7	1 35 13.4	− 0 08.0	+ 0 04 32.0	5 38.7	9.861 0094	0.233 2381	0.233 1668
6	257 42 19.9	1 35 09.9	+ 0 12.0	− 0 06 45.3	5 38.4	9.861 1430	0.233 0852	0.232 9932
8	260 52 36.5	1 35 06.7	0 31.9	0 18 00.9	5 37.1	9.861 2709	0.232 8910	0.232 7786
10	264 02 46.8	+ 1 35 03.7	+ 0 51.4	− 0 29 12.8	− 5 34.7	9.861 3927	0.232 6562	0.232 5238
12	267 12 51.6	1 35 01.1	1 10.2	0 40 19.1	5 31.3	9.861 5081	0.232 3816	0.232 2296
14	270 22 51.3	1 34 58.7	1 28.2	0 51 17.5	5 27.0	9.861 6168	0.232 0679	0.231 8966
16	273 32 46.6	1 34 56.6	1 45.1	1 02 06.3	5 21.6	9.861 7184	0.231 7156	0.231 5249
18	276 42 38.1	1 34 54.9	2 00.7	1 12 43.4	5 15.3	9.861 8126	0.231 3246	0.231 1146
20	279 52 26.3	+ 1 34 53.4	+ 2 14.9	− 1 23 06.9	− 5 08.1	9.861 8991	0.230 8948	0.230 6652
22	283 02 11.8	1 34 52.2	2 27.4	1 33 15.0	4 59.9	9.861 9777	0.230 4256	0.230 1760
24	286 11 55.2	1 34 51.3	2 38.1	1 43 05.9	4 50.8	9.862 0481	0.229 9163	0.229 6465
26	289 21 37.0	1 34 50.6	2 46.8	1 52 37.8	4 40.9	9.862 1102	0.229 3665	0.229 0762
28	292 31 17.9	1 34 50.2	2 53.5	2 01 49.0	4 30.1	9.862 1637	0.228 7756	0.228 4648
30	295 40 58.2	+ 1 34 50.2	+ 2 58.2	− 2 10 37.8	− 4 18.6	9.862 2086	0.228 1436	0.227 8120
32	298 50 38.7	+ 1 34 50.3	+ 3 00.6	− 2 19 02.7	− 4 06.2	9.862 2446	0.227 4701	

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GREENWICH MEAN NOON

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 0	312 37 45.1	+ 37 38.74	+ 11.5	− 1 50 22.4	− 7.84	0.142 96865	0.357 0300	0.357 3714
2	313 53 05.7	37 41.78	9.2	1 50 36.5	6.26	0.142 67677	0.357 7106	0.358 0474
4	315 08 32.1	37 44.65	6.8	1 50 47.4	4.66	0.142 40149	0.358 3820	0.358 7144
6	316 24 04.2	37 47.36	4.5	1 50 55.1	3.06	0.142 14301	0.359 0446	0.359 3724
8	317 39 41.4	37 49.88	+ 2.1	1 50 59.6	− 1.46	0.141 90150	0.359 6979	0.360 0213
10	318 55 23.6	+ 37 52.22	− 0.2	1 51 00.9	+ 0.15	0.141 67713	0.360 3423	0.360 6612
12	320 11 10.2	37 54.39	2.6	1 50 59.0	1.77	0.141 47005	0.360 9779	0.361 2923
14	321 27 01.1	37 56.38	5.0	1 50 53.9	3.39	0.141 28039	0.361 6045	0.361 9147
16	322 42 55.6	37 58.16	7.3	1 50 45.5	5.01	0.141 10827	0.362 2229	0.362 5292
18	323 58 53.6	37 59.77	9.7	1 50 33.8	6.64	0.140 95384	0.362 8336	0.363 1362
20	325 14 54.6	+ 38 01.20	− 12.0	− 1 50 18.9	+ 8.26	0.140 81719	0.363 4372	0.363 7366
22	326 30 58.3	38 02.44	14.3	1 50 00.7	9.89	0.140 69841	0.364 0345	0.364 3309
24	327 47 04.3	38 03.48	16.6	1 49 39.3	11.51	0.140 59759	0.364 6260	0.364 9198
26	329 03 12.1	38 04.32	18.8	1 49 14.7	13.12	0.140 51479	0.365 2122	0.365 5033
28	330 19 21.5	38 04.98	21.0	1 48 46.9	14.72	0.140 45007	0.365 7930	0.366 0813
30	331 35 32.0	+ 38 05.46	− 23.2	− 1 48 15.8	+ 16.32	0.140 40349	0.366 3681	0.366 6536
Feb. 1	332 51 43.2	38 05.72	25.3	1 47 41.6	17.92	0.140 37507	0.366 9376	0.367 2202
3	334 07 54.7	38 05.79	27.4	1 47 04.1	19.50	0.140 36484	0.367 5012	0.367 7805
5	335 24 06.2	38 05.68	29.4	1 46 23.6	21.07	0.140 37280	0.368 0582	0.368 3343
7	336 40 17.4	38 05.40	31.4	1 45 39.8	22.63	0.140 39893	0.368 6088	0.368 8815
9	337 56 27.7	+ 38 04.89	− 33.3	− 1 44 53.0	+ 24.18	0.140 44321	0.369 1525	0.369 4218
11	339 12 36.8	38 04.19	35.1	1 44 03.1	25.70	0.140 50563	0.369 6894	0.369 9553
13	340 28 44.4	38 03.31	36.9	1 43 10.2	27.22	0.140 58614	0.370 2195	0.370 4821
15	341 44 50.0	38 02.24	38.6	1 42 14.3	28.71	0.140 68466	0.370 7431	0.371 0027
17	343 00 53.2	38 00.98	40.2	1 41 15.4	30.19	0.140 80115	0.371 2607	0.371 5174
19	344 16 53.8	+ 37 59.53	41.8	− 1 40 13.5	+ 31.65	0.140 93551	0.371 7727	0.372 0267
21	345 32 51.2	37 57.87	43.2	1 39 08.8	33.08	0.141 08767	0.372 2795	0.372 5311
23	346 48 45.1	37 56.05	44.6	1 38 01.2	34.50	0.141 25750	0.372 7814	0.373 0304
25	348 04 35.3	37 54.05	45.9	1 36 50.8	35.89	0.141 44490	0.373 2782	0.373 5248
27	349 20 21.2	37 51.86	47.1	1 35 37.6	37.26	0.141 64970	0.373 7700	0.374 0137
Mar. 1	350 36 02.6	+ 37 49.49	48.2	1 34 21.8	+ 38.60	0.141 87179	0.374 2560	0.374 4967
3	351 51 39.1	37 46.94	49.2	1 33 03.2	39.91	0.142 11104	0.374 7358	0.374 9733
5	353 07 10.3	37 44.22	50.1	1 31 42.1	41.20	0.142 36726	0.375 2092	0.375 4433
7	354 22 35.8	37 41.32	50.9	1 30 18.4	42.46	0.142 64027	0.375 6755	0.375 9059
9	355 37 55.4	37 38.26	51.6	1 28 52.3	43.70	0.142 92990	0.376 1343	0.376 3606
11	356 53 08.7	+ 37 35.03	− 52.2	− 1 27 23.6	+ 44.90	0.143 23595	0.376 5848	0.376 8070
13	358 08 15.4	37 31.63	52.7	1 25 52.7	46.07	0.143 55822	0.377 0272	0.377 2453
15	359 23 15.2	37 28.07	53.1	1 24 19.4	47.21	0.143 89650	0.377 4613	0.377 6753
17	0 38 07.6	37 24.36	53.5	1 22 43.8	48.32	0.144 25052	0.377 8873	0.378 0975
19	1 52 52.5	37 20.50	53.7	1 21 06.1	49.40	0.144 62009	0.378 3059	0.378 5123
21	3 07 29.5	+ 37 16.48	− 53.8	− 1 19 26.2	+ 50.44	0.145 00497	0.378 7168	0.378 9195
23	4 21 58.4	37 12.32	53.8	1 17 44.3	51.46	0.145 40490	0.379 1203	0.379 3193
25	5 36 18.7	37 08.00	53.7	1 16 00.4	52.44	0.145 81964	0.379 5163	0.379 7114
27	6 50 30.3	37 03.56	53.5	1 14 14.6	53.38	0.146 24890	0.379 9044	0.380 0952
29	8 04 32.8	36 58.96	53.2	1 12 26.9	54.29	0.146 69241	0.380 2839	0.380 4704
31	9 18 26.0	+ 36 54.24	− 52.8	− 1 10 37.4	+ 55.17	0.147 14990	0.380 6546	0.380 8364
Apr. 2	10 32 09.7	+ 36 49.40	− 52.3	− 1 08 46.2	+ 56.01	0.147 62108	0.381 0158	0.381 1925

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GREENWICH MEAN NOON.

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												At Date.	At Intermediate Date.
	°	′	″	′	″	″	°	′	″	″			
Apr. 2	10	32	09.7	+36	49.40	− 52.3	− 1	08	46.2	+ 56.01	0.147 62108	0.381 0158	0.381 1925
4	11	45	43.6	36	44.45	51.7	1	06	53.4	56.81	0.148 10567	0.381 3665	0.381 5378
6	12	59	07.3	36	39.36	51.0	1	04	58.9	57.58	0.148 60338	0.381 7062	0.381 8717
8	14	12	20.8	36	34.13	50.3	1	03	03.0	58.32	0.149 11387	0.382 0343	0.382 1937
10	15	25	23.8	36	28.80	49.4	1	01	05.7	59.02	0.149 63685	0.382 3500	0.382 5032
12	16	38	16.0	+36	23.37	− 48.5	− 0	59	06.9	+ 59.68	0.150 17201	0.382 6534	0.382 8005
14	17	50	57.2	36	17.83	47.5	0	57	06.9	60.31	0.150 71902	0.382 9445	0.383 0851
16	19	03	27.2	36	12.19	46.4	0	55	05.7	60.90	0.151 27757	0.383 2228	0.383 3578
18	20	15	45.9	36	06.46	45.2	0	53	03.3	61.46	0.151 84732	0.383 4897	0.383 6184
20	21	27	53.0	36	00.64	43.9	0	50	59.9	61.96	0.152 42797	0.383 7440	0.383 8663
22	22	39	48.4	+35	54.74	− 42.6	− 0	48	55.4	+ 62.47	0.153 01918	0.383 9854	0.384 1014
24	23	51	31.9	35	48.74	41.2	0	46	50.0	62.92	0.153 62060	0.384 2142	0.384 3236
26	25	03	03.3	35	42.66	39.7	0	44	43.7	63.33	0.154 23190	0.384 4297	0.384 5323
28	26	14	22.5	35	36.50	38.1	0	42	36.6	63.72	0.154 85276	0.384 6314	0.384 7266
30	27	25	29.3	35	30.29	36.5	0	40	28.8	64.07	0.155 48283	0.384 8181	0.384 9057
May 2	28	36	23.6	+35	24.01	− 34.9	− 0	38	20.4	+ 64.38	0.156 12178	0.384 9894	0.385 0690
4	29	47	05.2	35	17.64	33.2	0	36	11.3	64.66	0.156 76926	0.385 1444	0.385 2155
6	30	57	34.1	35	11.22	31.4	0	34	01.7	64.91	0.157 42496	0.385 2821	0.385 3443
8	32	07	50.1	35	04.77	29.6	0	31	51.7	65.12	0.158 08852	0.385 4019	0.385 4549
10	33	17	53.2	34	58.26	27.7	0	29	41.2	65.30	0.158 75961	0.385 5034	0.385 5471
12	34	27	43.2	+34	51.70	− 25.8	− 0	27	30.5	+ 65.45	0.159 43786	0.385 5861	0.385 6206
14	35	37	20.0	34	45.09	23.9	0	25	19.4	65.57	0.160 12292	0.385 6504	0.385 6756
16	36	46	43.5	34	38.44	21.9	0	23	08.2	65.66	0.160 81444	0.385 6961	0.385 7120
18	37	55	53.7	34	31.75	19.9	0	20	56.8	65.72	0.161 51216	0.385 7232	0.385 7298
20	39	04	50.5	34	25.04	17.9	0	18	45.3	65.74	0.162 21569	0.385 7316	0.385 7285
22	40	13	33.8	+34	18.30	− 15.9	− 0	16	33.8	+ 65.74	0.162 92468	0.385 7205	0.385 7076
24	41	22	03.6	34	11.53	13.8	0	14	22.3	65.71	0.163 63884	0.385 6897	0.385 6667
26	42	30	19.9	34	04.75	11.7	0	12	11.0	65.65	0.164 35783	0.385 6385	0.385 6050
28	43	38	22.6	33	57.94	9.6	0	09	59.7	65.56	0.165 08132	0.385 5661	0.385 5218
30	44	46	11.6	33	51.11	7.5	0	07	48.7	65.44	0.165 80899	0.385 4718	0.385 4161
June 1	45	53	47.0	+33	44.27	− 5.4	− 0	05	38.0	+ 65.30	0.166 54049	0.385 3546	0.385 2870
3	47	01	03.7	33	37.43	3.3	0	03	27.5	65.14	0.167 27554	0.385 2133	0.385 1334
5	48	08	16.7	33	30.59	− 1.2	− 0	01	17.4	64.94	0.168 01379	0.385 0473	0.384 9547
7	49	15	11.1	33	23.74	+ 0.8	+ 0	00	52.3	64.72	0.168 75491	0.384 8559	0.384 7506
9	50	21	51.7	33	16.89	2.9	0	03	01.5	64.48	0.169 49862	0.384 6388	0.384 5205
11	51	28	18.6	+33	10.05	+ 5.0	+ 0	05	10.2	+ 64.21	0.170 24462	0.384 3958	0.384 2645
13	52	34	31.9	33	03.22	7.1	0	07	18.3	63.92	0.170 99260	0.384 1268	0.383 9826
15	53	40	31.5	32	56.39	9.1	0	09	25.9	63.61	0.171 74225	0.383 8318	0.383 6746
17	54	46	17.4	32	49.57	11.1	0	11	32.7	63.27	0.172 49327	0.383 5107	0.383 3401
19	55	51	49.8	32	42.77	13.1	0	13	38.9	62.92	0.173 24536	0.383 1628	0.382 9787
21	56	57	08.5	+32	35.99	+ 15.1·	+ 0	15	44.4	+ 62.54	0.173 99829	0.382 7878	0.382 5899
23	58	02	13.8	32	29.23	17.0	0	17	49.1	62.14	0.174 75172	0.382 3849	0.382 1730
25	59	07	05.5	32	22.49	18.9	0	19	53.0	61.73	0.175 50539	0.381 9539	0.381 7273
27	60	11	43.7	32	15.78	20.8	0	21	56.1	61.30	0.176 25899	0.381 4931	0.381 2515
29	61	16	08.6	32	09.10	22.7	0	23	58.2	60.84	0.177 01230	0.381 0021	0.380 7449
July 1	62	20	20.1	+32	02.43	+ 24.5	+ 0	25	59.4	+ 60.37	0.177 76501	0.380 4796	0.380 2062
3	63	24	18.4	+31	55.80	+ 26.2	+ 0	27	59.7	+ 59.88	0.178 51689	0.379 9247	0.379 6348

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	° ′ ″	′ ″	″	° ′ ″	″			
July 1	62 20 20.1	+32 02.43	+24.5	+0 25 59.4	+60.37	0.177 76501	0.380 4796	0.380 2062
3	63 24 18.4	31 55.80	26.2	0 27 59.7	59.88	0.178 51689	0.379 9247	0.379 6348
5	64 28 03.4	31 49.21	28.0	0 29 58.9	59.38	0.179 26767	0.379 3366	0.379 0299
7	65 31 35.3	31 42.66	29.7	0 31 57.2	58.86	0.180 01711	0.378 7148	0.378 3910
9	66 34 54.2	31 36.14	31.3	0 33 54.4	58.32	0.180 76492	0.378 0587	0.377 7180
11	67 37 59.9	+31 29.66	+32.9	+0 35 50.5	+57.76	0.181 51087	0.377 3689	0.377 0112
13	68 40 52.7	31 23.22	34.4	0 37 45.4	57.20	0.182 25471	0.376 6448	0.376 2697
15	69 43 32.8	31 16.82	35.9	0 39 39.3	56.62	0.182 99621	0.375 8860	0.375 4937
17	70 46 00.1	31 10.47	37.3	0 41 31.9	56.03	0.183 73517	0.375 0926	0.374 6825
19	71 48 14.7	31 04.17	38.7	0 43 23.4	55.42	0.184 47135	0.374 2636	0.373 8357
21	72 50 16.8	+30 57.91	+40.0	+0 45 13.6	+54.80	0.185 20453	0.373 3990	0.372 9528
23	73 52 06.4	30 51.71	41.3	0 47 02.6	54.18	0.185 93447	0.372 4973	0.372 0326
25	74 53 43.7	30 45.56	42.5	0 48 50.3	53.53	0.186 66098	0.371 5583	0.371 0743
27	75 55 08.7	30 39.45	43.6	0 50 36.7	52.88	0.187 38381	0.370 5804	0.370 0764
29	76 56 21.5	30 33.40	44.7	0 52 21.8	52.21	0.188 10280	0.369 5625	0.369 0382
31	77 57 22.3	+30 27.41	+45.8	+0 54 05.6	+51.55	0.188 81770	0.368 5039	0.367 9589
Aug. 2	78 58 11.2	30 21.48	46.7	0 55 48.0	50.86	0.189 52835	0.367 4034	0.366 8371
4	79 58 48.3	30 15.59	47.6	0 57 29.0	50.17	0.190 23454	0.366 2602	0.365 6727
6	80 59 13.6	30 09.76	48.5	0 59 08.7	49.46	0.190 93611	0.365 0743	0.364 4650
8	81 59 27.3	30 04.00	49.3	1 00 46.9	48.75	0.191 63286	0.363 8449	0.363 2139
10	82 59 29.6	+29 58.29	+50.0	+1 02 23.7	+48.03	0.192 32459	0.362 5721	0.361 9194
12	83 59 20.5	29 52.64	50.7	1 03 59.0	47.31	0.193 01116	0.361 2557	0.360 5810
14	84 59 00.2	29 47.06	51.3	1 05 32.9	46.58	0.193 69238	0.359 8952	0.359 1983
16	85 58 28.8	29 41.54	51.8	1 07 05.3	45.84	0.194 36809	0.358 4902	0.357 7707
18	86 57 46.4	29 36.08	52.3	1 08 36.3	45.09	0.195 03813	0.357 0399	0.356 2974
20	87 56 53.2	+29 30.69	+52.7	+1 10 05.6	+44.34	0.195 70232	0.355 5435	0.354 7778
22	88 55 49.3	29 25.37	53.0	1 11 33.6	43.59	0.196 36052	0.354 0001	0.353 2105
24	89 54 34.7	29 20.11	53.3	1 13 00.0	42.82	0.197 01256	0.352 4087	0.351 5945
26	90 53 09.8	29 14.92	53.5	1 14 24.9	42.05	0.197 65832	0.350 7677	0.349 9283
28	91 51 34.5	29 09.79	53.7	1 15 48.2	41.28	0.198 29763	0.349 0761	0.348 2110
30	92 49 49.0	+29 04.74	+53.8	+1 17 10.0	+40.51	0.198 93038	0.347 3329	0.346 4416
Sept. 1	93 47 53.5	28 59.74	53.8	1 18 30.3	39.72	0.199 55642	0.345 5370	0.344 6191
3	94 45 48.0	28 54.81	53.8	1 19 48.9	38.94	0.200 17560	0.343 6879	0.342 7431
5	95 43 32.8	28 49.96	53.7	1 21 06.0	38.15	0.200 78780	0.341 7848	0.340 8132
7	96 41 07.9	28 45.18	53.5	1 22 21.5	37.36	0.201 39290	0.339 8281	0.338 8294
9	97 38 33.5	+28 40.47	+53.3	+1 23 35.4	+36.56	0.201 99076	0.337 8170	0.336 7910
11	98 35 49.8	28 35.84	53.0	1 24 47.8	35.76	0.202 58127	0.335 7511	0.334 6975
13	99 32 56.9	28 31.27	52.7	1 25 58.5	34.96	0.203 16432	0.333 6300	0.332 5484
15	100 29 54.9	28 26.77	52.3	1 27 07.6	34.15	0.203 73979	0.331 4528	0.330 3431
17	101 26 44.0	28 22.34	51.9	1 28 15.1	33.35	0.204 30758	0.329 2190	0.328 0805
19	102 23 24.3	+28 17.98	+51.4	+1 29 21.0	+32.54	0.204 86757	0.326 9273	0.325 7594
21	103 19 56.0	28 13.70	50.8	1 30 25.3	31.73	0.205 41967	0.324 5765	0.323 3784
23	104 16 19.2	28 09.48	50.2	1 31 27.9	30.92	0.205 96378	0.322 1650	0.320 9362
25	105 12 34.0	28 05.35	49.6	1 32 28.9	30.11	0.206 49978	0.319 6917	0.318 4313
27	106 08 40.6	28 01.28	48.9	1 33 28.3	29.29	0.207 02759	0.317 1549	0.315 8624
29	107 04 39.2	+27 57.30	+48.1	+1 34 26.1	+28.47	0.207 54711	0.314 5536	0.313 2286
Oct. 1	108 00 29.8	+27 53.38	+47.3	+1 35 22.2	+27.66	0.208 05824	0.311 8872	0.310 5293

MARS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Oct. 1	108 00 29.8	+27 53.38	+47.3	+1 35 22.2	+27.66	0.208 05824	0.311 8872	0.310 5293
3	108 56 12.7	27 49.53	46.4	1 36 16.7	26.84	0.208 56091	0.309 1549	0.307 7639
5	109 51 48.0	27 45.77	45.5	1 37 09.6	26.02	0.209 05504	0.306 3563	0.304 9320
7	110 47 15.8	27 42.07	44.6	1 38 00.8	25.20	0.209 54055	0.303 4910	0.302 0331
9	111 42 36.3	27 38.44	43.6	1 38 50.4	24.38	0.210 01734	0.300 5583	0.299 0666
11	112 37 49.7	+27 34.90	+42.6	+1 39 38.3	+23.56	0.210 48535	0.297 5579	0.296 0320
13	113 32 56.0	27 31.43	41.5	1 40 24.6	22.75	0.210 94448	0.294 4889	0.292 9283
15	114 27 55.4	27 28.03	40.3	1 41 09.3	21.93	0.211 39470	0.291 3502	0.289 7546
17	115 22 48.1	27 24.71	39.2	1 41 52.3	21.10	0.211 83591	0.288 1411	0.286 5096
19	116 17 34.4	27 21.46	38.0	1 42 33.7	20.28	0.212 26805	0.284 8599	0.283 1917
21	117 12 14.0	+27 18.29	+36.8	+1 43 13.4	+19.46	0.212 69106	0.281 5049	0.279 7994
23	118 06 47.5	27 15.19	35.6	1 43 51.5	18.64	0.213 10487	0.278 0746	0.276 3308
25	119 01 14.8	27 12.16	34.3	1 44 28.4	17.83	0.213 50942	0.274 5673	0.272 7844
27	119 55 36.2	27 09.20	32.9	1 45 02.9	17.01	0.213 90465	0.270 9818	0.269 1594
29	120 49 51.7	27 06.33	31.6	1 45 36.1	16.20	0.214 29051	0.267 3170	0.265 4546
31	121 44 01.5	+27 03.53	+30.2	+1 46 07.7	+15.38	0.214 66694	0.263 5718	0.261 6691
Nov. 2	122 38 05.9	27 00.80	28.8	1 46 37.6	14.57	0.215 03388	0.259 7459	0.257 8026
4	123 32 04.8	26 58.15	27.3	1 47 06.0	13.76	0.215 39128	0.255 8387	0.253 8546
6	124 25 58.5	26 55.57	25.9	1 47 32.7	12.94	0.215 73910	0.251 8498	0.249 8245
8	125 19 47.1	26 53.08	24.4	1 47 57.7	12.12	0.216 07728	0.247 7783	0.245 7113
10	126 13 30.8	+26 50.65	+22.9	+1 48 21.2	+11.32	0.216 40579	0.243 6234	0.241 5145
12	127 07 09.8	26 48.29	21.3	1 48 43.0	10.57	0.216 72458	0.239 3844	0.237 2330
14	128 00 44.1	26 46.01	19.8	1 49 03.2	9.71	0.217 03359	0.235 0600	0.232 8654
16	128 54 13.9	26 43.82	18.2	1 49 21.8	8.90	0.217 33280	0.230 6488	0.228 4100
18	129 47 39.4	26 41.70	16.6	1 49 38.8	8.10	0.217 62216	0.226 1488	0.223 8649
20	130 41 00.7	+26 39.64	+15.0	+1 49 54.2	+7.30	0.217 90164	0.221 5581	0.219 2283
22	131 34 18.0	26 37.67	13.4	1 50 08.0	6.49	0.218 17122	0.216 8753	0.214 4986
24	132 27 31.5	26 35.77	11.8	1 50 20.2	5.69	0.218 43087	0.212 0983	0.209 6743
26	133 20 41.2	26 33.93	10.2	1 50 30.8	4.89	0.218 68053	0.207 2265	0.204 7545
28	134 13 47.3	26 32.18	8.6	1 50 39.8	4.10	0.218 92015	0.202 2584	0.199 7382
30	135 06 49.9	+26 30.51	+ 6.9	+1 50 47.2	+3.31	0.219 14973	0.197 1938	0.194 6253
Dec. 2	135 59 49.3	26 28.90	5.3	1 50 53.0	2.52	0.219 36924	0.192 0326	0.189 4153
4	136 52 45.6	26 27.38	3.6	1 50 57.3	1.72	0.219 57866	0.186 7736	0.184 1074
6	137 45 38.9	26 25.92	2.0	1 50 59.9	0.93	0.219 77796	0.181 4167	0.178 7013
8	138 38 29.3	26 24.53	+ 0.3	1 51 01.0	+0.15	0.219 96712	0.175 9613	0.173 1966
10	139 31 17.0	+26 23.23	− 1.3	+1 51 00.5	− 0.63	0.220 14610	0.170 4070	0.167 5923
12	140 24 02.3	26 22.00	3.0	1 50 58.5	1.42	0.220 31487	0.164 7524	0.161 8874
14	141 16 45.1	26 20.84	4.6	1 50 54.9	2.19	0.220 47343	0.158 9970	0.156 0809
16	142 09 25.7	26 19.76	6.3	1 50 49.7	2.97	0.220 62176	0.153 1388	0.150 1706
18	143 02 04.2	26 18.75	7.9	1 50 42.9	3.75	0.220 75986	0.147 1760	0.144 1549
20	143 54 40.7	+26 17.81	− 9.5	+1 50 34.7	− 4.52	0.220 88769	0.141 1072	0.138 0326
22	144 47 15.4	26 16.95	11.1	1 50 24.8	5.30	0.221 00524	0.134 9312	0.131 8029
24	145 39 48.6	26 16.17	12.7	1 50 13.5	6.07	0.221 11251	0.128 6476	0.125 4653
26	146 32 20.2	26 15.46	14.3	1 50 00.6	6.83	0.221 20948	0.122 2559	0.119 0197
28	147 24 50.4	26 14.83	15.9	1 49 46.1	7.60	0.221 29612	0.115 7566	0.112 4668
30	148 17 19.5	+26 14.26	− 17.5	+1 49 30.2	− 8.36	0.221 37243	0.109 1504	0.105 8074
32	149 09 47.5	+26 13.76	− 19.0	+1 49 12.7	− 9.12	0.221 43842	0.102 4380	.

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	° ′ ″	′ ″	″	° ′ ″	″		At Date.	At Intermediate Date.
Jan. 0	293 35 00.1	+ 5 05.92	+ 12.7	− 0 19 11.5	− 6.78	0.711 1733	0.785 3002	0.785 6984
4	293 55 24.1	5 06.09	13.0	0 19 38.6	6.77	0.711 0522	0.786 0361	0.786 3130
8	294 15 48.8	5 06.26	13.3	0 20 05.6	6.76	0.710 9312	0.786 5292	0.786 6842
12	294 36 14.2	5 06.43	13.5	0 20 32.7	6.76	0.710 8103	0.786 7782	0.786 8110
16	294 56 40.3	5 06.60	13.8	0 20 59.7	6.75	0.710 6895	0.786 7829	0.786 6940
20	295 17 07.0	+ 5 06.77	+ 14.1	− 0 21 26.7	− 6.74	0.710 5688	0.786 5445	0.786 3348
24	295 37 34.4	5 06.94	14.4	0 21 53.7	6.73	0.710 4483	0.786 0649	0.785 7349
28	295 58 02.6	5 07.11	14.6	0 22 20.6	6.73	0.710 3280	0.785 3448	0.784 8944
Feb. 1	296 18 31.4	5 07.28	14.9	0 22 47.5	6.72	0.710 2078	0.784 3839	0.783 8134
5	296 39 00.8	5 07.45	15.1	0 23 14.3	6.71	0.710 0878	0.783 1829	0.782 4922
9	296 59 31.0	+ 5 07.62	+ 15.4	− 0 23 41.2	− 6.70	0.709 9679	0.781 7413	0.780 9307
13	297 20 01.8	5 07.79	15.7	0 24 08.0	6.69	0.709 8481	0.780 0608	0.779 1322
17	297 40 33.3	5 07.96	15.9	0 24 34.7	6.68	0.709 7285	0.778 1453	0.777 1003
21	298 01 05.5	5 08.13	16.2	0 25 01.4	6.67	0.709 6091	0.775 9978	0.774 8383
25	298 21 38.4	5 08.30	16.5	0 25 28.1	6.66	0.709 4899	0.773 6219	0.772 3487
Mar. 1	298 42 12.0	+ 5 08.47	+ 16.7	− 0 25 54.7	− 6.65	0.709 3709	0.771 0190	0.769 6328
5	299 02 46.2	5 08.64	17.0	0 26 21.3	6.64	0.709 2520	0.768 1908	0.766 6933
9	299 23 21.1	5 08.81	17.2	0 26 47.9	6.63	0.709 1333	0.765 1409	0.763 5338
13	299 43 56.7	5 08.98	17.5	0 27 14.4	6.62	0.709 0148	0.761 8729	0.760 1590
17	300 04 33.0	5 09.15	17.7	0 27 40.9	6.61	0.708 8965	0.758 3929	0.756 5756
21	300 25 10.0	+ 5 09.32	+ 18.0	− 0 28 07.3	− 6.60	0.708 7784	0.754 7078	0.752 7901
25	300 45 47.6	5 09.49	18.2	0 28 33.7	6.59	0.708 6605	0.750 8231	0.748 8076
29	301 06 25.9	5 09.66	18.4	0 29 00.0	6.58	0.708 5428	0.746 7443	0.744 6339
Apr. 2	301 27 04.9	5 09.83	18.7	0 29 26.3	6.56	0.708 4253	0.742 4773	0.740 2749
6	301 47 44.5	5 09.99	18.9	0 29 52.5	6.55	0.708 3080	0.738 0282	0.735 7381
10	302 08 24.8	+ 5 10.16	+ 19.1	− 0 30 18.6	− 6.54	0.708 1910	0.733 4062	0.731 0338
14	302 29 05.8	5 10.33	19.4	0 30 44.8	6.52	0.708 0743	0.728 6225	0.726 1738
18	302 49 47.5	5 10.50	19.6	0 31 10.8	6.51	0.707 9578	0.723 6890	0.721 1697
22	303 10 29.8	5 10.66	19.8	0 31 36.8	6.50	0.707 8414	0.718 6172	0.716 0330
26	303 31 12.8	5 10.83	20.0	0 32 02.8	6.48	0.707 7252	0.713 4186	0.710 7755
30	303 51 56.5	+ 5 11.00	+ 20.2	− 0 32 28.7	− 6.47	0.707 6092	0.708 1056	0.705 4107
May 4	304 12 40.8	5 11.17	20.4	0 32 54.6	6.46	0.707 4935	0.702 6929	0.699 9542
8	304 33 25.8	5 11.33	20.6	0 33 20.4	6.44	0.707 3781	0.697 1973	0.694 4247
12	304 54 11.4	5 11.49	20.9	0 33 46.1	6.43	0.707 2630	0.691 6392	0.688 8434
16	305 14 57.7	5 11.66	21.1	0 34 11.8	6.41	0.707 1482	0.686 0401	0.683 2319
20	305 35 44.7	+ 5 11.83	+ 21.3	− 0 34 37.4	− 6.39	0.707 0337	0.680 4216	0.677 6116
24	305 56 32.4	5 11.99	21.5	0 35 02.9	6.38	0.706 9194	0.674 8052	0.672 0051
28	306 17 20.7	5 12.16	21.7	0 35 28.4	6.36	0.706 8054	0.669 2147	0.666 4369
June 1	306 38 09.6	5 12.32	21.9	0 35 53.8	6.35	0.706 6916	0.663 6753	0.660 9340
5	306 58 59.2	5 12.48	22.1	0 36 19.2	6.33	0.706 5781	0.658 2170	0.655 5280
9	307 19 49.5	+ 5 12.65	+ 22.2	− 0 36 44.5	− 6.31	0.706 4649	0.652 8713	0.650 2513
13	307 40 40.4	5 12.81	22.4	0 37 09.7	6.30	0.706 3520	0.647 6718	0.645 1369
17	308 01 32.0	5 12.97	22.6	0 37 34.9	6.28	0.706 2394	0.642 6505	0.640 2167
21	308 22 24.2	5 13.14	22.8	0 38 00.0	6.26	0.706 1271	0.637 8395	0.635 5229
25	308 43 17.1	5 13.30	22.9	0 38 25.0	6.24	0.706 0151	0.633 2712	0.631 0886
29	309 04 10.6	+ 5 13.46	+ 23.1	− 0 38 49.9	− 6.22	0.705 9035	0.628 9705	0.626 0482
July 3	309 25 04.8	+ 5 13.62	+ 23.3	− 0 39 14.7	− 6.21	0.705 7921	0.624 0991	0.623 1369

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 3	309 25 04.8	+ 5 13.62	+ 23.3	− 0 39 14.7	− 6.21	0.705 7921	0.624 9991	0.623 1369
7	309 45 59.6	5 13.78	23.4	0 39 39.5	6.19	0.705 6811	0.621 3657	0.619 6901
11	310 06 55.0	5 13.94	23.6	0 40 04.2	6.17	0.705 5704	0.618 1132	0.616 6388
15	310 27 51.1	5 14.10	23.7	0 40 28.9	6.15	0.705 4600	0.615 2698	0.614 0095
19	310 48 47.8	5 14.26	23.9	0 40 53.5	6.13	0.705 3499	0.612 8605	0.611 8257
23	311 09 45.2	+ 5 14.42	+ 24.0	− 0 41 17.9	− 6.11	0.705 2401	0.610 9073	0.610 1077
27	311 30 43.2	5 14.58	24.2	0 41 42.3	6.09	0.705 1307	0.609 4292	0.608 8738
31	311 51 41.9	5 14.75	24.3	0 42 06.7	6.07	0.705 0216	0.608 4430	0.608 1388
Aug. 4	312 12 41.1	5 14.90	24.5	0 42 30.9	6.05	0.704 9129	0.607 9619	0.607 9126
8	312 33 41.0	5 15.06	24.6	0 42 55.1	6.03	0.704 8046	0.607 9912	0.608 1972
12	312 54 41.6	+ 5 15.21	+ 24.7	− 0 43 19.1	− 6.01	0.704 6966	0.608 5298	0.608 9882
16	313 15 42.7	5 15.37	24.8	0 43 43.1	5.99	0.704 5890	0.609 5708	0.610 2756
20	313 36 44.5	5 15.53	25.0	0 44 07.0	5.97	0.704 4818	0.611 1006	0.612 0441
24	313 57 46.9	5 15.68	25.1	0 44 30.8	5.94	0.704 3749	0.613 1039	0.614 2779
28	314 18 50.0	5 15.84	25.2	0 44 54.6	5.92	0.704 2684	0.615 5632	0.616 9572
Sept. 1	314 39 53.6	+ 5 15.99	+ 25.3	− 0 45 18.2	− 5.90	0.704 1623	0.618 4562	0.620 0572
5	315 00 57.9	5 16.15	25.4	0 45 41.7	5.87	0.704 0566	0.621 7558	0.623 5480
9	315 22 02.8	5 16.30	25.5	0 46 05.2	5.85	0.703 9513	0.625 4296	0.627 3964
13	315 43 08.3	5 16.46	25.6	0 46 28.6	5.83	0.703 8464	0.629 4437	0.631 5669
17	316 04 14.4	5 16.61	25.7	0 46 51.8	5.81	0.703 7418	0.633 7619	0.636 0246
21	316 25 21.2	+ 5 16.76	+ 25.8	− 0 47 15.0	− 5.78	0.703 6377	0.638 3508	0.640 7361
25	316 46 28.5	5 16.91	25.9	0 47 38.1	5.76	0.703 5340	0.643 1766	0.645 6682
29	317 07 36.5	5 17.06	26.0	0 48 01.1	5.73	0.703 4307	0.648 2064	0.650 7870
Oct. 3	317 28 45.0	5 17.21	26.1	0 48 23.9	5.71	0.703 3279	0.653 4054	0.656 0570
7	317 49 54.1	5 17.36	26.2	0 48 46.7	5.68	0.703 2255	0.658 7378	0.661 4433
11	318 11 03.9	+ 5 17.51	+ 26.2	− 0 49 09.4	− 5.66	0.703 1235	0.664 1697	0.666 9129
15	318 32 14.2	5 17.66	26.3	0 49 32.0	5.63	0.703 0219	0.669 6694	0.672 4356
19	318 53 25.2	5 17.81	26.4	0 49 54.5	5.61	0.702 9208	0.675 2084	0.677 9848
23	319 14 36.7	5 17.96	26.4	0 50 16.9	5.58	0.702 8201	0.680 7616	0.683 5359
27	319 35 48.8	5 18.11	26.5	0 50 39.1	5.55	0.702 7198	0.686 3045	0.689 0644
31	319 57 01.6	+ 5 18.25	+ 26.6	− 0 51 01.3	− 5.53	0.702 6199	0.691 8125	0.694 5458
Nov. 4	320 18 14.9	5 18.39	26.6	0 51 23.3	5.50	0.702 5205	0.697 2617	0.699 9575
8	320 39 28.8	5 18.54	26.6	0 51 45.3	5.47	0.702 4216	0.702 6307	0.705 2787
12	321 00 43.2	5 18.69	26.7	0 52 07.1	5.45	0.702 3232	0.707 8998	0.710 4918
16	321 21 58.3	5 18.83	26.7	0 52 28.9	5.42	0.702 2253	0.713 0532	0.715 5822
20	321 43 13.9	+ 5 18.98	+ 26.8	− 0 52 50.5	− 5.39	0.702 1278	0.718 0772	0.720 5367
24	322 04 30.1	5 19.12	26.8	0 53 12.0	5.36	0.702 0308	0.722 9590	0.725 3424
28	322 25 46.9	5 19.26	26.8	0 53 33.4	5.33	0.701 9342	0.727 6852	0.729 9857
Dec. 2	322 47 04.2	5 19.41	26.8	0 53 54.7	5.30	0.701 8381	0.732 2426	0.734 4544
6	323 08 22.1	5 19.55	26.9	0 54 15.9	5.28	0.701 7426	0.736 6199	0.738 7379
10	323 29 40.6	+ 5 19.69	+ 26.9	− 0 54 36.9	− 5.25	0.701 6476	0.740 8076	0.742 8279
14	323 50 59.7	5 19.83	26.9	0 54 57.9	5.23	0.701 5530	0.744 7983	0.746 7180
18	324 12 19.3	5 19.97	26.9	0 55 18.7	5.19	0.701 4589	0.748 5865	0.750 4030
22	324 33 39.4	5 20.11	26.9	0 55 39.4	5.16	0.701 3653	0.752 1669	0.753 8771
26	324 55 00.1	5 20.25	26.9	0 56 00.0	5.13	0.701 2722	0.755 5330	0.757 1337
30	325 16 21.4	+ 5 20.38	+ 26.9	− 0 56 20.4	− 5.10	0.701 1796	0.758 6785	0.760 1668
34	325 37 43.2	+ 5 20.52	+ 26.9	− 0 56 40.8	− 5.07	0.701 0875	0.761 5981	

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
Jan. 0	288 28 24.2	+ 1 48.74	− 0 14.7	+ 0 11 21.3	− 4.71	1.001 9680	1.042 0553	1.042 2250
4	288 35 39.2	1 48.75	0 14.3	0 11 02.4	4.71	1.001 9522	1.042 3537	1.042 4411
8	288 42 54.2	1 48.76	0 13.9	0 10 43.6	4.71	1.001 9363	1.042 4872	1.042 4917
12	288 50 09.2	1 48.77	0 13.5	0 10 24.7	4.71	1.001 9203	1.042 4548	1.042 3764
16	288 57 24.3	1 48.77	0 13.1	0 10 05.9	4.71	1.001 9042	1.042 2568	1.042 0961
20	289 04 39.4	+ 1 48.78	− 0 12.7	+ 0 09 47.0	− 4.71	1.001 8880	1.041 8944	1.041 6522
24	289 11 54.5	1 48.79	0 12.3	0 09 28.2	4.72	1.001 8717	1.041 3696	1.041 0469
28	289 19 09.7	1 48.80	0 11.9	0 09 09.3	4.72	1.001 8554	1.040 6841	1.040 2812
Feb. 1	289 26 24.9	1 48.80	0 11.5	0 08 50.4	4.72	1.001 8390	1.039 8385	1.039 3563
5	289 33 40.1	1 48.81	0 11.1	0 08 31.5	4.72	1.001 8224	1.038 8349	1.038 2745
9	289 40 55.4	+ 1 48.82	− 0 10.7	+ 0 08 12.7	− 4.72	1.001 8057	1.037 6756	1.037 0384
13	289 48 10.7	1 48.83	0 10.3	0 07 53.8	4.72	1.001 7889	1.036 3636	1.035 6520
17	289 55 26.0	1 48.84	0 09.8	0 07 34.9	4.72	1.001 7719	1.034 9040	1.034 1202
21	290 02 41.4	1 48.85	0 09.4	0 07 16.0	4.72	1.001 7548	1.033 3012	1.032 4477
25	290 09 56.8	1 48.86	0 09.0	0 06 57.1	4.72	1.001 7376	1.031 5602	1.030 6392
Mar. 1	290 17 12.2	+ 1 48.86	− 0 08.6	+ 0 06 38.2	− 4.73	1.001 7203	1.029 6853	1.028 6991
5	290 24 27.7	1 48.87	0 08.2	0 06 19.3	4.73	1.001 7029	1.027 6814	1.026 6330
9	290 31 43.2	1 48.88	0 07.8	0 06 00.4	4.73	1.001 6855	1.025 5546	1.024 4469
13	290 38 58.8	1 48.89	0 07.4	0 05 41.5	4.73	1.001 6679	1.023 3111	1.022 1483
17	290 46 14.4	1 48.90	0 07.0	0 05 22.6	4.73	1.001 6502	1.020 9595	1.019 7456
21	290 53 30.0	+ 1 48.91	− 0 06.7	+ 0 05 03.7	− 4.73	1.001 6323	1.018 5077	1.017 2471
25	291 00 45.7	1 48.92	0 06.2	0 04 44.8	4.73	1.001 6142	1.015 9646	1.014 6611
29	291 08 01.4	1 48.93	0 05.7	0 04 25.9	4.73	1.001 5960	1.013 3376	1.011 9956
Apr. 2	291 15 17.1	1 48.94	0 05.3	0 04 07.0	4.73	1.001 5776	1.010 6360	1.009 2599
6	291 22 32.8	1 48.95	0 04.9	0 03 48.0	4.73	1.001 5592	1.007 8688	1.006 4641
10	291 29 48.6	+ 1 48.96	− 0 04.5	+ 0 03 29.1	− 4.73	1.001 5408	1.005 0472	1.003 6195
14	291 37 04.5	1 48.96	0 04.1	0 03 10.2	4.73	1.001 5223	1.002 1827	1.000 7387
18	291 44 20.4	1 48.97	0 03.7	0 02 51.2	4.73	1.001 5038	0.999 2888	0.997 8344
22	291 51 36.3	1 48.98	0 03.3	0 02 32.3	4.73	1.001 4851	0.996 3768	0.994 9173
26	291 58 52.2	1 48.99	0 02.8	0 02 13.4	4.74	1.001 4662	0.993 4576	0.991 9993
30	292 06 08.2	+ 1 49.00	− 0 02.4	+ 0 01 54.4	− 4.74	1.001 4471	0.990 5441	0.989 0936
May 4	292 13 24.2	1 49.01	0 02.0	0 01 35.5	4.74	1.001 4279	0.987 6496	0.986 2137
8	292 20 40.3	1 49.02	0 01.6	0 01 16.6	4.74	1.001 4084	0.984 7878	0.983 3742
12	292 27 56.4	1 49.03	0 01.2	0 00 57.6	4.74	1.001 3890	0.981 9747	0.980 5912
16	292 35 12.6	1 49.04	0 00.8	0 00 38.7	4.74	1.001 3695	0.979 2253	0.977 8788
20	292 42 28.8	+ 1 49.05	− 0 00.4	+ 0 00 19.7	− 4.74	1.001 3500	0.976 5533	0.975 2507
24	292 49 45.0	1 49.06	0 00.0	+ 0 00 00.8	4.74	1.001 3304	0.973 9726	0.972 7207
28	292 57 01.3	1 49.07	+ 0 00.5	− 0 00 18.1	4.74	1.001 3106	0.971 4968	0.970 3027
June 1	293 04 17.6	1 49.08	0 00.9	0 00 37.1	4.74	1.001 2907	0.969 1402	0.968 0112
5	293 11 33.9	1 49.09	0 01.3	0 00 56.0	4.74	1.001 2707	0.966 9175	0.965 8610
9	293 18 50.3	+ 1 49.10	+ 0 01.7	− 0 01 15.0	− 4.74	1.001 2505	0.964 8432	0.963 8661
13	293 26 06.7	1 49.11	0 02.1	0 01 34.0	4.74	1.001 2302	0.962 9309	0.962 0393
17	293 33 23.2	1 49.12	0 02.5	0 01 52.9	4.74	1.001 2097	0.961 1924	0.960 3914
21	293 40 39.7	1 49.13	0 02.9	0 02 11.8	4.74	1.001 1892	0.959 6378	0.958 9329
25	293 47 56.2	1 49.14	0 03.4	0 02 30.8	4.74	1.001 1686	0.958 2778	0.957 0734
29	293 55 12.8	+ 1 49.15	+ 0 03.8	− 0 02 49.8	− 4.74	1.001 1479	0.957 1209	0.956 6214
July 3	294 02 29.5	+ 1 49.16	+ 0 04.2	− 0 03 08.8	− 4.74	1.001 1271	0.956 1760	0.955 7858

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
July 3	294 02 29.5	+ 1 49.16	+ 0 04.2	− 0 03 08.8	− 4.74	1.001 1271	0.956 1760	0.955 7858
7	294 09 46.1	1 49.17	0 04.6	0 03 27.7	4.74	1.001 1061	0.955 4513	0.955 1730
11	294 17 02.8	1 49.19	0 05.0	0 03 46.7	4.74	1.001 0851	0.954 9515	0.954 7873
15	294 24 19.6	1 49.20	0 05.4	0 04 05.7	4.74	1.001 0640	0.954 6801	0.954 6303
19	294 31 36.4	1 49.21	0 05.8	0 04 24.6	4.74	1.001 0428	0.954 6378	0.954 7026
23	294 38 53.3	+ 1 49.22	+ 0 06.3	− 0 04 43.6	− 4.74	1.001 0214	0.954 8246	0.955 0036
27	294 46 10.2	1 49.23	0 06.7	0 05 02.6	4.74	1.000 9999	0.955 2392	0.955 5315
31	294 53 27.1	1 49.24	0 07.1	0 05 21.5	4.74	1.000 9782	0.955 8798	0.956 2838
Aug. 4	295 00 44.1	1 49.25	0 07.5	0 05 40.5	4.74	1.000 9565	0.956 7427	0.957 2560
8	295 08 01.1	1 49.26	0 07.9	0 05 59.5	4.74	1.000 9347	0.957 8224	0.958 4408
12	295 15 18.1	+ 1 49.27	+ 0 08.3	− 0 06 18.4	− 4.74	1.000 9128	0.959 1099	0.959 8287
16	295 22 35.2	1 49.28	0 08.7	0 06 37.4	4.74	1.000 8909	0 960 5958	0.961 4098
20	295 29 52.4	1 49.29	0 09.1	0 06 56.4	4.74	1.000 8688	0.962 2695	0.963 1735
24	295 37 09.6	1 49.30	0 09.6	0 07 15.3	4.74	1.000 8466	0.964 1203	0.965 1085
28	295 44 26.8	1 49.31	0 10.0	0 07 34.3	4.74	1.000 8242	0.966 1368	0.967 2038
Sept. 1	295 51 44.1	+ 1 49.32	+ 0 10.4	− 0 07 53.3	− 4.74	1.000 8017	0.968 3076	0.969 4463
5	295 59 01.4	1 49.34	0 10.8	0 08 12.2	4.74	1.000 7790	0.970 6180	0.971 8210
9	296 06 18.8	1 49.35	0 11.2	0 08 31.2	4.74	1.000 7563	0.973 0534	0.974 3133
13	296 13 36.2	1 49.36	0 11.6	0 08 50.2	4.74	1.000 7335	0.975 5988	0.976 9079
17	296 20 53.7	1 49.37	0 12.0	0 09 09.1	4.74	1.000 7106	0.978 2388	0.979 5897
21	296 28 11.2	+ 1 49.38	+ 0 12.4	− 0 09 28.1	− 4.74	1.000 6876	0.980 9590	0.982 3451
25	296 35 28.7	1 49.39	0 12.8	0 09 47.1	4.74	1.000 6646	0.983 7461	0.985 1601
29	296 42 46.3	1 49.40	0 13.3	0 10 06.0	4.74	1.000 6415	0.986 5854	0.988 0200
Oct. 3	296 50 03.9	1 49.41	0 13.7	0 10 25.0	4.74	1.000 6182	0.989 4621	0.990 9097
7	296 57 21.6	1 49.42	0 14.1	0 10 44.0	4.74	1.000 5948	0.992 3610	0.993 8141
11	297 04 39.4	+ 1 49.43	+ 0 14.5	− 0 11 02.9	− 4.74	1.000 5712	0.995 2674	0.996 7191
15	297 11 57.2	1 49.45	0 14.9	0 11 21.9	4.74	1.000 5473	0.998 1676	0.999 6115
19	297 19 15.0	1 49.46	0 15.3	0 11 40.9	4.74	1.000 5235	1.001 0493	1.002 4796
23	297 26 32.9	1 49.47	0 15.7	0 11 59.8	4.74	1.000 4996	1.003 9009	1.005 3119
27	297 33 50.8	1 49.48	0 16.1	0 12 18.8	4.74	1.000 4756	1.006 7110	1.008 0966
31	297 41 08.8	+ 1 49.50	+ 0 16.5	− 0 12 37.7	− 4.74	1.000 4515	1.009 4674	1.010 8219
Nov. 4	297 48 26.8	1 49.51	0 16.9	0 12 56.7	4.74	1.000 4273	1.012 1586	1.013 4760
8	297 55 44.9	1 49.53	0 17.3	0 13 15.7	4.74	1.000 4030	1.014 7732	1.016 0490
12	298 03 03.0	1 49.54	0 17.8	0 13 34.6	4.74	1.000 3786	1.017 3023	1.018 5316
16	298 10 21.2	1 49.55	0 18.2	0 13 53.6	4.74	1.000 3541	1.019 7364	1.020 9160
20	298 17 39.4	+ 1 49.57	+ 0 18.6	− 0 14 12.5	− 4.74	1.000 3295	1.022 0691	1.023 1947
24	298 24 57.7	1 49.58	0 19.0	0 14 31.5	4.74	1.000 3046	1.024 2918	1.025 3597
28	298 32 16.1	1 49.59	0 19.4	0 14 50.4	4.74	1.000 2797	1.026 3973	1.027 4037
Dec. 2	298 39 34.4	1 49.60	0 19.8	0 15 09.4	4.74	1.000 2548	1.028 3780	1.029 3193
6	298 46 52.9	1 49.61	0 20.2	0 15 28.3	4.74	1.000 2298	1.030 2270	1.031 1002
10	298 54 11.4	+ 1 49.62	+ 0 20.6	− 0 15 47.2	− 4.74	1.000 2048	1.031 9386	1.032 7416
14	299 01 29.9	1 49.63	0 21.0	0 16 06.2	4.74	1.000 1796	1.033 5087	1.034 2395
18	299 08 48.4	1 49.65	0 21.4	0 16 25.1	4.74	1.000 1543	1.034 9335	1.035 5902
22	299 16 07.1	1 49.66	0 21.8	0 16 44.1	4.73	1.000 1289	1.036 2090	1.036 7894
26	299 23 25.8	1 49.68	0 22.2	0 17 03.0	4.73	1.000 1033	1.037 3309	1.037 8332
30	299 30 44.5	+ 1 49.69	+ 0 22.6	− 0 17 21.9	− 4.73	1.000 0776	1.038 2959	1.03 8 7184
34	299 38 03.3	+ 1 49.70	+ 0 23.0	− 0 17 40.9	− 4.73	1.000 0517	1.039 1006	

URANUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 0	257 22 16.8	+ 42.70	+ 1.3	− 0 03 04.5	− 0.58	1.281 6209	1.301 9464	1.301 3849
8	257 27 58.3	42.69	1.3	0 03 09.1	0.58	1.281 6536	1.300 7322	1.299 9904
16	257 33 39.8	42.69	1.3	0 03 13.7	0.58	1.281 6863	1.299 1629	1.298 2533
24	257 39 21.3	42.68	1.3	0 03 18.3	0.58	1.281 7191	1.297 2655	1.296 2030
Feb. 1	257 45 02.7	42.67	1.4	0 03 22.9	0.57	1.281 7518	1.295 0697	1.293 8701
9	257 50 44.0	+ 42.66	+ 1.4	− 0 03 27.5	− 0.57	1.281 7845	1.292 6088	1.291 2915
-17	257 56 25.3	42.66	1.4	0 03 32.1	0.57	1.281 8172	1.289 9245	1.288 5135
25	258 02 06.5	42.65	1.5	0 03 36.7	0.57	1.281 8499	1.287 0648	1.285 5842
Mar. 5	258 07 47.7	42.64	1.5	0 03 41.3	0.57	1.281 8825	1.284 0779	1.282 5530
13	258 13 28.8	42.64	1.5	0 03 45.9	0.57	1.281 9152	1.281 0169	1.279 4774
21	258 19 09.9	+ 42.63	+ 1.6	− 0 03 50.5	− 0.57	1.281 9479	1.277 9417	1.276 4170
29	258 24 50.9	42.62	1.6	0 03 55.1	0.57	1.281 9805	1.274 9105	1.273 4292
Apr. 6	258 30 31.8	42.61	1.6	0 03 59.7	0.57	1.282 0132	1.271 9809	1.270 5733
14	258 36 12.7	42.61	1.6	0 04 04.3	0.57	1.282 0458	1.269 2140	1.267 9104
22	258 41 53.5	42.60	1.7	0 04 08.9	0.57	1.282 0785	1.266 6690	1.265 4959
30	258 47 34.3	+ 42.59	+ 1.7	− 0 04 13.5	− 0.57	1.282 1111	1.264 3974	1.263 3795
May 8	258 53 15.0	42.59	1.7	0 04 18.0	0.57	1.282 1437	1.262 4482	1.261 6097
16	258 58 55.7	42.58	1.8	0 04 22.6	0.57	1.282 1764	1.260 8674	1.260 2263
24	259 04 36.3	42.57	1.8	0 04 27.2	0.57	1.282 2090	1.259 6889	1.259 2583
June 1	259 10 16.9	42.56	1.8	0 04 31.8	0.57	1.282 2416	1.258 9369	1.258 7272
9	259 15 57.4	+ 42.56	+ 1.9	− 0 04 36.4	− 0.57	1.282 2742	1.258 6307	1.258 6478
17	259 21 37.8	42.55	1.9	0 04 40.9	0.57	1.282 3067	1.258 7779	1.259 0196
25	259 27 18.2	42.54	1.9	0 04 45.5	0.57	1.282 3393	1.259 3715	1.259 8319
July 3	259 32 58.5	42.54	2.0	0 04 50.1	0.57	1.282 3718	1.260 3986	1.261 0686
11	259 38 38.8	42.53	2.0	0 04 54.6	0.57	1.282 4044	1.261 8379	1.262 7018
19	259 44 19.0	+ 42.52	+ 2.0	− 0 04 59.2	− 0.57	1.282 4369	1.263 6551	1.264 6924
27	259 49 59.1	42.52	2.1	0 05 03.8	0.57	1.282 4694	1.265 8089	1.266 9989
Aug. 4	259 55 39.2	42.51	2.1	0 05 08.3	0.57	1.282 5019	1.268 2562	1.269 5744
12	260 01 19.3	42.50	2.1	0 05 12.9	0.57	1.282 5343	1.270 9460	1.272 3639
20	260 06 59.2	42.49	2.2	0 05 17.4	0.57	1.282 5668	1.273 8211	1.275 3109
28	260 12 39.2	+ 42.49	+ 2.2	− 0 05 22.0	− 0.57	1.282 5992	1.276 8268	1.278 3617
Sept. 5	260 18 19.0	42.48	2.2	0 05 26.6	0.57	1.282 6316	1.279 9079	1.281 4579
13	260 23 58.8	42.47	2.3	0 05 31.1	0.57	1.282 6640	1.283 0047	1.284 5414
21	260 29 38.6	42.47	2.3	0 05 35.7	0.57	1.282 6964	1.286 0618	1.287 5598
29	260 35 18.3	42.46	2.3	0 05 40.2	0.57	1.282 7288	1.289 0288	1.290 4626
Oct. 7	260 40 57.9	+ 42.45	+ 2.4	− 0 05 44.8	− 0.57	1.282 7611	1.291 8547	1.293 1991
15	260 46 37.5	42.45	2.4	0 05 49.3	0.57	1.282 7935	1.294 4906	1.295 7244
23	260 52 17.0	42.44	2.4	0 05 53.8	0.57	1.282 8258	1.296 8961	1.298 0012
31	260 57 56.5	42.43	2.4	0 05 58.4	0.57	1.282 8581	1.299 0345	1.299 9919
Nov. 8	261 03 35.9	42.42	2.5	0 06 02.9	0.57	1.282 8904	1.300 8697	1.301 6646
16	261 09 15.3	+ 42.42	+ 2.5	− 0 06 07.5	− 0.57	1.282 9227	1.302 3740	1.302 9955
24	261 14 54.6	42.41	2.5	0 06 12.0	0.57	1.282 9550	1.303 5266	1.303 9649
Dec. 2	261 20 33.8	42.40	2.5	0 06 16.5	0.57	1.282 9873	1.304 3083	1.304 5555
10	261 26 13.0	42.39	2.6	0 06 21.1	0.57	1.283 0195	1.304 7057	1.304 7586
18	261 31 52.1	42.39	2.6	0 06 25.6	0.57	1.283 0518	1.304 7144	1.304 5731
26	261 37 31.2	+ 42.38	+ 2.6	− 0 06 30.1	− 0.57	1.283 0841	1.304 3348	1.303 9998
34	261 43 10.2	+ 42.37	+ 2.7	− 0 06 34.7	− 0.57	1.283 1163	1.303 5693	

NEPTUNE.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan 0	90 07 41.8	+ 21.87	− 49.1	− 1 09 27.1	+ 0.51	1.475 4586	1.461 1218	1.461 3297
8	90 10 36.8	21.87	49.1	1 09 23.0	0.51	1.475 4613	1.461 6105	1.461 9627
16	90 13 31.8	21.87	49.1	1 09 18.9	0.51	1.475 4640	1.462 3841	1.462 8721
24	90 16 26.8	21.87	49.1	1 09 14.8	0.52	1.475 4667	1.463 4233	1.464 0348
Feb. 1	90 19 21.8	21.87	49.1	1 09 10.7	0.52	1.475 4695	1.464 7030	1.465 4243
9	90 22 16.8	+ 21.87	− 49.1	− 1 09 06.5	+ 0.52	1.475 4722	1.466 1947	1.467 0099
17	90 25 11.8	21.87	49.1	1 09 02.4	0.52	1.475 4749	1.467 8648	1.468 7545
25	90 28 06.7	21.87	49.0	1 08 58.3	0.52	1.475 4777	1.469 6743	1.470 6197
Mar. 5	90 31 01.7	21.87	49.0	1 08 54.1	0.52	1.475 4804	1.471 5857	1.472 5676
13	90 33 56.7	21.87	49.0	1 08 50.0	0.52	1.475 4832	1.473 5604	1.474 5594
21	90 36 51.7	+ 21.87	− 49.0	− 1 08 45.9	+ 0.52	1.475 4860	1 475 5592	1.476 5547
29	90 39 46.7	21.87	49.0	1 08 41.7	0.52	1.475 4887	1.477 5416	1.478 5161
Apr. 6	90 42 41.7	21.87	49.0	1 08 37.6	0.52	1.475 4915	1.479 4736	1.480 4096
14	90 45 36.7	21.87	48.9	1 08 33.4	0.52	1.475 4943	1.481 3200	1.482 2009
22	90 48 31.7	21.87	48.9	1 08 29.3	0.52	1.475 4971	1.483 0487	1.483 8605
30	90 51 26.7	+ 21.87	− 48.9	− 1 08 25.1	+ 0.52	1.475 4999	1.484 6332	1.485 3638
May 8	90 54 21.6	21.87	48.9	1 08 20.9	0.52	1.475 5027	1.486 0493	1.486 6867
16	90 57 16.6	21.87	48.9	1 08 16.8	0.52	1.475 5055	1.487 2737	1.487 8084
24	91 00 11.6	21.87	48.9	1 08 12.6	0.52	1.475 5083	1.488 2892	1.488 7147
June 1	91 03 06.6	21.87	48.9	1 08 08.4	0.52	1.475 5112	1.489 0832	1.489 3932
9	91 06 01.6	+ 21.87	− 48.8	− 1 08 04.3	+ 0.52	1.475 5140	1.489 6435	1.489 8327
17	91 08 56.6	21.87	48.8	1 08 00.1	0.52	1.475 5169	1.489 9611	1.490 0286
25	91 11 51.6	21.87	48.8	1 07 55.9	0.52	1.475 5197	1.490 0351	1.489 9800
July 3	91 14 46.6	21.87	48.8	1 07 51.7	0.52	1.475 5226	1.489 8637	1.489 6863
11	91 17 41.6	21.87	48.8	1 07 47.6	0.52	1.475 5255	1.489 4484	1.489 1512
19	91 20 36.6	+ 21.87	− 48.8	− 1 07 43.4	+ 0.52	1.475 5284	1.488 7961	1.488 3843
27	91 23 31.6	21.88	48.7	1 07 39.2	0.52	1.475 5313	1.487 9170	1.487 3958
Aug. 4	91 26 26.6	21.88	48.7	1 07 35.0	0.52	1.475 5342	1.486 8223	1.486 1986
12	91 29 21.6	21.88	48.7	1 07 30.8	0.52	1.475 5372	1.485 5274	1.484 8113
20	91 32 16.6	21.88	48.7	1 07 26.6	0.53	1.475 5400	1.484 0531	1.483 2556
28	91 35 11.6	+ 21.88	− 48.7	− 1 07 22.4	+ 0.53	1.475 5429	1.482 4217	1.481 5546
Sept. 5	91 38 06.6	21.88	48.7	1 07 18.2	0.53	1.475 5459	1.480 6578	1.479 7351
13	91 41 01.6	21.88	48.6	1 07 14.0	0.53	1.475 5488	1.478 7907	1.477 8288
21	91 43 56.6	21.88	48.6	1 07 09.8	0.53	1.475 5518	1.476 8534	1.475 8683
29	91 46 51.6	21.88	48.6	1 07 05.6	0.53	1.475 5547	1.474 8782	1.473 8876
Oct. 7	91 49 46.6	+ 21.88	48.6	− 1 07 01.3	+ 0.53	1.475 5577	1.472 9015	1.471 9251
15	91 52 41.6	21.88	48.6	1 06 57.1	0.53	1.475 5607	1.470 9628	1.470 0194
23	91 55 36.7	21.88	48.6	1 06 52.9	0.53	1.475 5637	1.469 0997	1.468 2082
31	91 58 31.7	21.88	48.5	1 06 48.7	0.53	1.475 5667	1.467 3499	1.466 5298
Nov. 8	92 01 26.7	21.88	48.5	1 06 44.5	0.53	1.475 5697	1.465 7523	1.465 0223
16	92 04 21.7	+ 21.88	− 48.5	− 1 06 40.2	+ 0.53	1.475 5727	1.464 3432	1.463 7188
24	92 07 16.7	21.88	48.5	1 06 36.0	0.53	1.475 5757	1.463 1527	1.462 6487
Dec. 2	92 10 11.8	21.88	48.5	1 06 31.7	0.53	1.475 5788	1.462 2102	1.461 8395
10	92 13 06.8	21.88	48.4	1 06 27.5	0.53	1.475 5818	1.461 5393	1.461 3111
18	92 16 01.8	21.88	48.4	1 06 23.3	0.53	1.475 5849	1.461 1560	1.461 0749
26	92 18 56.8	+ 21.88	− 48.4	− 1 06 19.0	+ 0.53	1.475 5879	1.461 0687	1.461 1379
34	92 21 51.9	+ 21.88	− 48.4	− 1 06 14.8	+ 0.53	1.475 5910	1.461 2822	

SUN'S CO-ORDINATES, 1902.

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox. Noon.	X True Equinox. Midnight.	Reduc. to Mean Eq'x of Jan. o. Noon.	Y True Equinox. Noon.	Y True Equinox. Midnight.	Reduc. to Mean Eq'x of Jan. o. Noon.	Z True Equinox. Noon.	Z True Equinox. Midnight.	Reduc. to Mean Eq'x of Jan. o. Noon.
Jan. 1	+0.173 5900	+0.182 1928	− 558	−0.887 8499	−0.886 3991	+ 45	−0.385 1304	−0.384 5008	− 365
2	0.190 7817	0.199 3562	564	0.884 8793	0.883 2905	33	0.383 8412	0.383 1518	368
3	0.207 9154	0.216 4587	570	0.881 6328	0.879 9062	21	0.382 4326	0.381 6833	372
4	0.224 9855	0.233 4951	575	0.878 1110	0.876 2473	+ 10	0.380 9042	0.380 0954	375
5	0.241 9867	0.250 4597	580	0.874 3151	0.872 3145	− 1	0.379 2569	0.378 3888	379
6	+0.258 9134	+0.267 3470	− 585	−0.870 2458	−0.868 1090	− 12	−0.377 4912	−0.376 5640	− 382
7	0.275 7600	0.284 1515	590	0.865 9044	0.863 6320	23	0.375 6074	0.374 6217	385
8	0.292 5210	0.300 8677	594	0.861 2921	0.858 8848	34	0.373 6063	0.372 5618	388
9	0.309 1910	0.317 4901	598	0.856 4103	0.853 8688	46	0.371 4883	0.370 3858	391
10	0.325 7644	0.334 0131	602	0.851 2605	0.848 5857	59	0.369 2543	0.368 0940	394
11	+0.342 2357	+0.350 4313	− 605	−0.845 8446	−0.843 0375	− 72	−0.366 9049	−0.365 6872	− 397
12	0.358 5996	0.366 7396	608	0.840 1644	0.837 2257	86	0.364 4410	0.363 1664	400
13	0.374 8508	0.382 9323	611	0.834 2217	0.831 1527	100	0.361 8635	0.360 5324	403
14	0.390 9837	0.399 0043	614	0.828 0190	0.824 8207	114	0.359 1733	0.357 7862	406
15	0.406 9934	0.414 9504	616	0.821 5583	0.818 2320	128	0.356 3713	0.354 9288	409
16	+0.422 8747	+0.430 7658	− 618	−0.814 8422	−0.811 3893	− 142	−0.353 4587	−0.351 9612	− 411
17	0.438 6231	0.446 4459	619	0.807 8735	0.804 2950	156	0.350 4364	0.348 8846	414
18	0.454 2336	0.461 9857	620	0.800 6543	0.796 9518	170	0.347 3057	0.345 6999	417
19	0.469 7017	0.477 3809	620	0.793 1877	0.789 3622	184	0.344 0674	0.342 4084	420
20	0.485 0228	0.492 6270	620	0.785 4757	0.781 5287	199	0.340 7229	0.339 0111	422
21	+0.500 1929	+0.507 7198	− 620	−0.777 5215	−0.773 4543	− 214	−0.337 2731	−0.335 5092	− 425
22	0.515 2074	0.522 6551	619	0.769 3276	0.765 1416	229	0.333 7193	0.331 9036	427
23	0.530 0624	0.537 4287	618	0.760 8967	0.756 5931	244	0.330 0623	0.328 1956	430
24	0.544 7536	0.552 0365	617	0.752 2311	0.747 8112	259	0.326 3036	0.324 3803	432
25	0.559 2770	0.566 4745	616	0.743 3335	0.738 7984	274	0.322 4440	0.320 4767	435
26	+0.573 6284	+0.580 7383	− 614	−0.734 2063	−0.729 5575	− 290	−0.318 4846	−0.316 4679	− 437
27	0.587 8035	0.594 8236	612	0.724 8522	0.720 0908	305	0.314 4267	0.312 3611	439
28	0.601 7981	0.608 7263	609	0.715 2736	0.710 4011	321	0.310 2713	0.308 1575	441
29	0.615 6078	0.622 4420	606	0.705 4735	0.700 4913	336	0.306 0198	0.303 8583	443
30	0.629 2284	0.635 9664	602	0.695 4547	0.690 3642	352	0.301 6733	0.299 4648	445
31	+0.642 6555	+0.649 2952	− 598	−0.685 2200	−0.680 0226	− 367	−0.297 2331	−0.294 9782	− 447
Feb. 1	0.655 8850	0.662 4243	594	0.674 7723	0.669 4696	383	0.292 7005	0.290 4001	449
2	0.668 9125	0.675 3492	589	0.664 1150	0.658 7088	398	0.288 0771	0.285 7317	451
3	0.681 7339	0.688 0661	584	0.653 2514	0.647 7431	414	0.283 3641	0.280 9745	452
4	0.694 3452	0.700 5707	579	0.642 1845	0.636 5759	429	0.278 5631	0.276 1301	454
5	+0.706 7421	+0.712 8589	− 573	−0.630 9179	−0.625 2108	− 444	−0.273 6756	−0.271 1999	− 455
6	0.718 9207	0.724 9268	567	0.619 4551	0.613 6514	459	0.268 7031	0.266 1855	457
7	0.730 8768	0.736 7703	560	0.607 8000	0.601 9014	474	0.263 6472	0.261 0886	458
8	0.742 6068	0.748 3858	553	0.595 9561	0.589 9646	489	0.258 5098	0.255 9110	459
9	0.754 1067	0.759 7691	545	0.583 9277	0.577 8456	504	0.253 2924	0.250 6543	460
10	+0.765 3726	+0.770 9170	− 537	−0.571 7189	−0.565 5478	− 518	−0.247 9969	0.245 3202	− 461
11	0.776 4018	0.781 8263	529	0.559 3332	0.553 0756	533	0.242 6247	0.239 9106	462
12	0.787 1903	0.792 4934	520	0.546 7756	0.540 4336	548	0.237 1782	0.234 4276	463
13	0.797 7351	0.802 9151	511	0.534 0501	0.527 6259	563	0.231 6590	0.228 8727	463
14	0.808 0331	0.813 0887	502	0.521 1613	0.514 6570	578	0.226 0689	0.223 2478	464
15	+0.818 0817	+0.823 0117	− 492	−0.508 1136	−0.501 5314	− 592	0.220 4097	−0.217 5549	− 464
16	+0.827 8783	+0.832 6812	− 482	−0.494 9112	−0.488 2535	− 606	−0.214 6835	0.211 7959	− 465

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox. Noon.	Midnight.	Reduc. to Mean Eq'x of Jan. o. Noon.	Y True Equinox Noon.	Midnight.	Reduc. to Mean Eq'x of Jan o. Noon.	Z True Equinox. Noon.	Midnight.	Reduc. to Mean Eq'x of Jan o. Noon.
Feb. 16	+0.827 8783	+0.832 6812	− 482	−0.494 9112	−0.488 2535	− 606	−0.214 6835	−0.211 7959	− 465
17	0.837 4202	0.842 0950	472	0.481 5587	0.474 8274	620	0.208 8921	0.205 9723	465
18	0.846 7052	0.851 2506	462	0.468 0601	0.461 2574	634	0.203 0369	0.200 0863	465
19	0.855 7309	0.860·1459	451	0.454 4197	0.447 5477	647	0.197 1206	0.194 1397	465
20	0.864 4954	0.868 7789	440	0.440 6419	0.433 7027	660	0.191 1441	0.188 1340	465
21	+0.872 9963	+0.877 1473	− 428	−0.426 7306	−0.419 7262	− 673	−0.185 1096	−0.182 0712	− 465
22	0.881 2316	0.885 2490	416	0.412 6899	0.405 6222	686	0.179 0189	0.175 9530	464
23	0.889 1991	0.893 0818	404	0.398 5239	0.391 3951	699	0.172 8737	0.169 7812	464
24	0.896 8968	0.900 6437	392	0.384 2368	0.377 0490	712	0.166 6758	0.163 5577	463
25	0.904 3223	0.907 9324	379	0.369 8324	0.362 5875	724	0.160 4270	0.157 2840	463
26	+0.911 4737	+0.914 9459	− 366	−0.355 3149	−0.348 0151	− 736	−0.154 1290	−0.150 9622	− 462
27	0.918 3488	0.921 6821	353	0.340 6887	0.333 3362	748	0.147 7838	0.144 5941	461
28	0.924 9455	0.928 1390	339	0.325 9580	0.318 5547	760	0.141 3934	0.138 1818	460
Mar. 1	0.931 2621	0.934 3144	325	0.311 1270	0.303 6754	772	0.134 9595	0.131 7268	459
2	0.937 2958	0.940 2063	311	0.296 2004	0.288 7025	783	0.128 4840	0.125 2313	458
3	+0.943 0456	+0.945 8133	− 297	−0.281 1823	−0.273 6405	− 794	−0.121 9690	−0.118 6974	− 457
4	0.948 5093	0.951 1334	282	0.266 0776	0.258 4941	805	0.115 4166	0.112 1269	456
5	0.953 6853	0.956 1648	267	0.250 8906	0.243 2679	816	0.108 8286	0.105 5220	454
6	0.958 5718	0.960 9060	252	0.235 6265	0.227 9668	826	0.102 2072	0.098 8846	453
7	0.963 1672	0.965 3552	237	0.220 2895	0.212 5953	836	0.095 5544·	0.092 2169	451
8	+0.967 4700	+0.969 5114	− 222	−0.204 8848	− 0.197 1586	− 846	−0.088 8724	−0.085 5211	·· 449
9	0.971 4791	0.973 3730	206	0.189 4172	0.181 6614	856	0.082 1633	0.078 7992	447
10	0.975 1929	0.976 9389	190	0.173 8918	0.166 1091	865	0.075 4292	0.072 0536	445
11	0.978 6108	0.980 2084	174	0.158 3138	0.150 5066	874	0.068 6724	0.065 2861	443
12	0.981 7318	0.983 1808	157	0.142 6882	0.134 8592	883	0.061 8950	0.058 4993	441
13	+0.984 5553	+0.985 8553	·· 140	−0.127 0202	−0.119 1719	− 892	−0.055 0993	−0.051 6952	− 438
14	0.987 0809	0.988 2320	124	0.111 3150	0.103 4500	900	0.048 2874	0.044 8761	435
15	0.989 3085	0.990 3105	108	0.095 5775	0.087 6983	908	0.041 4615	0.038 0440	432
16	0.991 2379	0.992 0908	92	0.079 8128	0.071 9218	916	0.034 6237	0.031 2010	429
17	0.992 8693	0.993 5733	76	0.064 0258	0.056 1254	924	0.027 7762	0.024 3494	426
18	+0.994 2028	+0.994 7579	− 59	−0.048 2213	−0.040 3139	− 931	− 0.020 9208	−0.017 4908	− 423
19	0.995 2387	0.995 6451	42	0.032 4040	0.024 4918	938	0.014 0597	0.010 6276	419
20	0.995 9772	0.996 2351	25	0.016 5781	−0.008 6634	945	0.007 1948	− 0.003 7616	416
21	0.996 4187	0.996 5282	− 8	−0.000 7484	+0.007 1664	951	0.000 3281	+0.003 1053	412
22	0.996 5634	0.996 5248	+ 11	+0.015 0804	0.022 9933	957	+0.006 5385	0.009 9711	409
23	+0.996 4122	+0.996 2255	+ 30	+0.030 9044	+0.038 8131	− 963	+0.013 4030	+0.016 8338	− 405
24	0.995 9649	0.995 6303	49	0.046 7189	0.054 6212	968	0.020 2634	0.023 6916	401
25	0.995 2219	0.994 7397	68	0.062 5196	0.070 4134	973	0.027 1181	0.030 5426	397
26	0.994 1837	0.993 5541	87	0.078 3022	0.086 1852	978	0.033 9649	0.037 3848	393
27	0.992 8508	0.992 0738	107	0.094 0620	0.101 9322	982	0.040 8019	0.044 2161	389
28	+0.991 2232	+0.990 2992	+ 127	+0.109 7950	+0.117 6499	− 986	+0.047 6271	+0.051 0347	− 385
29	0.989 3018	0.988 2311	147	0.125 4963	0.133 3338	990	0.054 4387	0.057 8386	380
30	0.987 0871	0.985 8700	166	0.141 1617	0.148 9795	994	0.061 2344	0.064 6258	376
31	0.984 5798	0.983 2166	185	0.156 7866	0.164 5824	998	0.068 0126	0.071 3944	371
32	0.981 7804	0.980 2715	204	0.172 3664	0.180 1380	1001	0.074 7710	0.078 1422	366
33	+0.978 6899	+0.977 0357	+ 223	+0.187 8966	+0.195 6416	− 1004	+0.081 5077	+0.084 8674	− 361
34	+0.975 3090	+0.973 5100	+ 242	+0.203 3725	+0.211 0886	− 1007	+0.088 2209	+0.091 5679	− 356

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FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox. Noon.	Midnight.	Reduc. to Mean Eq'x of Jan. 0. Noon.	Y True Equinox. Noon.	Midnight.	Reduc. to Mean Eq'x of Jan. 0. Noon.	Z True Equinox. Noon.	Midnight.	Reduc. to Mean Eq'x of Jan. 0. Noon.
Apr. 1	+0.981 7804	+0.980 2715	+ 204	+0.172 3664	+0.180 1380	− 1001	+0.074 7710	+0.078 1422	− 366
2	0.978 6899	0.977 0357	223	0.187 8966	0.195 6416	1004	0.081 5077	0.084 8674	361
3	0.975 3090	0.973 5100	242	0.203 3725	0.211 0886	1007	0.088 2209	0.091 5679	356
4	0.971 6387	0.969 6952	261	0.218 7893	0.226 4743	1010	0.094 9082	0.098 2416	350
5	0.967 6798	0.965 5926	280	0.234 1428	0.241 7941	1012	0.101 5677	0.104 8864	345
6	+0.963 4338	+0.961 2035	+ 300	+0.249 4277	+0.257 0431	− 1014	+0.108 1974	+0.111 5005	− 339
7	0.958 9019	0.956 5292	319	0.264 6395	0.272 2164	1016	0.114 7953	0.118 0816	333
8	0.954 0856	0.951 5713	339	0.279 7731	0.287 3092	1017	0.121 3592	0.124 6278	326
9	0.948 9865	0.946 3316	359	0.294 8239	0.302 3167	1018	0.127 8871	0.131 1369	320
10	0.943 6067	0.940 8122	379	0.309 7871	0.317 2344	1018	0.134 3770	0.137 6071	313
11	+0.937 9483	+0.935 0153	+ 398	+0.324 6580	+0.332 0573	− 1018	+0.140 8269	+0.144 0362	− 307
12	0.932 0135	0.928 9432	418	0.339 4319	0.346 7813	1018	0.147 2348	0.150 4225	300
13	0.925 8047	0.922 5984	438	0.354 1048	0.361 4019	1018	0.153 5991	0.156 7641	293
14	0.919 3245	0.915 9833	458	0.368 6721	0.375 9149	1017	0.159 9175	0.163 0591	286
15	0.912 5752	p.909 1005	478	0.383 1298	0.390 3162	1016	0.166 1886	0.169 3059	280
16	+0.905 5595	+0.901 9526	+ 498	+0.397 4738	+0.404 6020	− 1015	+0.172 4107	+0.175 5028	· 273
17	0.898 2801	0.894 5423	518	0.411 7004	0.418 7685	1014	0.178 5819	0.181 6480	266
18	0.890 7395	0.886 8720	538	0.425 8058	0.432 8118	1012	0.184 7008	0.187 7400	259
19	0.882 9402	0.878 9443	558	0.439 7861	0.446 7284	1010	0.190 7655	0.193 7771	252
20	0.874 8848	0.870 7619	578	0.453 6381	0.460 5145	1008	0.196 7746	0.199 7577	245
21	+0.866 5760	+0.862 3273	+ 598	+0.467 3574	+0.474 1664	− 1005	+0.202 7263	+0.205 6802	− 238
22	0.858 0161	0.853 6429	618	0.480 9411	0.487 6808	1002	0.208 6192	0.211 5431	231
23	0.849 2078	0.844 7113	638	0.494 3855	0.501 0544	999	0.214 4517	0.217 3447	223
24	0.840 1536	0.835 5351	658	0.507 6871	0.514 2832	995	0.220 2221	0.223 0836	215
25	0.830 8562	0.826 1170	678	0.520 8422	0.527 3637	991	0.225 9291	0.228 7581	207
26	+0.821 3180	+0.816 4595	+ 698	+0.533 8472	+0.540 2924	− 987	+0.231 5707	+0.234 3667	− 199
27	0.811 5419	0.806 5655	718	0.546 6987	0.553 0658	982	0.237 1458	0.239 9078	191
28	0.801 5306	0.796 4376	738	0.559 3931	0.565 6803	977	0.242 6525	0.245 3799	183
29	0.791 2868	0.786 0786	758	0.571 9268	0.578 1322	972	0.248 0896	0.250 7813	175
30	0.780 8134	0.775 4915	778	0.584 2962	0.590 4183	966	0.253 4550	0.256 1105	166
May 1	+0.770 1133	+0.764 6792	+ 798	+0.596 4980	+0.602 5348	− 960	+0.258 7476	+0.261 3661	·· 158
2	0.759 1895	0.753 6446	818	0.608 5283	0.614 4782	954	0.263 9657	0.266 5464	149
3	0.748 0449	0.742 3909	838	0.620 3839	0.626 2449	948	0.269 1078	0.271 6498	140
4	0.736 6829	0.730 9213	857	0.632 0609	0.637 8313	941	0.274 1723	0.276 6750	131
5	0.725 1066	0.719 2392	877	0.643 5558	0.649 2338	934	0.279 1578	0.281 6204	122
6	+0.713 3196	+0.707 3482	+ 896	+0.654 8649	+0.660 4487	− 926	+0.284 0026	+ 0.286 4843	− 113
7	0.701 3254	0.695 2518	916	0.665 9847	0.671 4726	918	0.288 8852	0.291 2052	104
8	0.689 1280	0.682 9544	935	0.676 9118	0.682 3020	910	0.293 6242	0.295 9620	95
9	0.676 7315	0.670 4598	955	0.687 6428	0.692 9337	902	0.298 2783	0.300 5730	86
10	0.664 1399	0.657 7722	974	0.698 1745	0.703 3648	893	0.302 8460	0.305 0971	76
11	+0.651 3574	+0.644 8959	+ 993	+0.708 5041	+0.713 5921	−· 884	+0.307 3262	+0.309 5330	·· 67
12	0.638 3882	0.631 8350	1012	0.718 6286	0.723 6132	874	0.311 7175	0.313 8796	57
13	0.625 2367	0.618 5937	1031	0.728 5455	0.733 4253	864	0.316 0191	0.318 1358	48
14	0.611 9070	0.605 1767	1050	0.738 2523	0.743 0261	854	0.320 2296	0.322 3004	38
15	0.598 4034	0.591 5877	1069	0.747 7466	0.752 4135	843	0.324 3481	0.326 3726	28
16	+0.584 7301	+0.577 8308	+ 1088	+0.757 0264	+0.761 5848	·· 832	+0.328 3737	+0.330 3512	18
17	+0.570 8906	+0.563 9101	+ 1107	+0.766 0887	+0.770 5380	821	+0.332 3051	+0.334 2353	− 8

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox. Noon.	Midnight.	Reduc. to Mean Eq'x of Jan.o. Noon.	Y True Equinox. Noon.	Midnight.	Reduc. to Mean Eq'x of Jan.o. Noon.	Z True Equinox. Noon.	Midnight.	Reduc. to Mean Eq'x of Jan.o. Noon
May 17	+0.570 8906	+0.563 9101	+ 1107	+0.766 0887	+0.770 5380	− 821	+0.332 3051	+0.334 2353	− 8
18	0.556 8897	0.549 8299	1125	0.774 9324	0.779 2714	809	0.336 1417	0.338 0244	+ 2
19	0.542 7312	0.535 5944	1143	0.783 5549	0.787 7826	797	0.339 8829	0.341 7169	12
20	0.528 4196	0.521 2069	1161	0.791 9542	0.796 0695	785	0.343 5265	0.345 3119	23
21	0.513 9573	0.506 6715	1179	0.800 1283	0.804 1303	772	0.347 0728	0.348 8090	33
22	+0.499 3499	+0.491 9928	+ 1197	+0.808 0752	+0.811 9628	− 759	+0.350 5204	+0.352 2070	+ 44
23	0.484 6008	0.477 1744	1215	0.815 7929	0.819 5652	745	0.353 8687	0.355 5052	54
24	0.469 7140	0.462 2203	1232	0.823 2794	0.826 9354	731	0.357 1165	0.358 7027	65
25	0.454 6937	0.447 1347	1250	0.830 5329	0.834 0717	717	0.360 2635	0.361 7985	75
26	0.439 5438	0.431 9214	1267	0.837 5516	0.840 9721	702	0.363 3079	0.364 7916	86
27	+0.424 2682	+0.416 5847	+ 1284	+0.844 3332	+0.847 6346	− 687	+0.366 2495	+0.367 6815	+ 97
28	0.408 8713	0.401 1287	1301	0.850 8760	0.854 0573	671	0.369 0874	0.370 4672	108
29	0.393 3573	0.385 5575	1317	0.857 1782	0.860 2384	655	0.371 8208	0.373 1480	118
30	0.377 7299	0.369 8754	1333	0.863 2377	0.866 1760	639	0.374 4488	0.375 7231	129
31	0.361 9942	0.354 0868	1349	0.869 0530	0.871 8683	622	0.376 9707	0.378 1916	140
June 1	+0.346 1538	+0.338 1959	+ 1365	+0.874 6217	+0.877 3132	− 605	+0.379 3856	+0.380 5526	+ 151
2	0.330 2136	0.322 2075	1380	0.879 9424	0.882 5090	588	0.381 6926	0.382 8055	162
3	0.314 1781	0.306 1261	1395	0.885 0129	0.887 4539	570	0.383 8913	0.384 9497	173
4	0.298 0520	0.289 9564	1410	0.889 8318	0.892 1463	552	0.385 9808	0.386 9844	184
5	0.281 8400	0.273 7036	1425	0.894 3973	0.896 5846	533	0.387 9605	0.388 9089	195
6	+0.265 5478	+0.257 3730	+ 1439	+0.898 7080	+0.900 7674	− 514	+0.389 8297	+0.390 7227	+ 206
7	0.249 1799	0.240 9692	1453	0.902 7626	0.904 6936	495	0.391 5879	0.392 4252	217
8	0.232 7415	0.224 4975	1467	0.906 5601	0.908 3621	475	0.393 2347	0.394 0162	228
9	0.216 2379	0.207 9633	1480	0.910 0994	0.911 7721	455	0.394 7697	0.395 4953	240
10	0.199 6743	0.191 3714	1493	0.913 3800	0.914 9231	435	0.396 1928	0.396 8622	254
11	+0.183 0553	+0.174 7266	+ 1506	+0.916 4013	+0.917 8146	− 414	+0.397 5035	+0.398 1166	+ 262
12	0.166 3860	0.158 0339	1518	0.919 1630	0.920 4462	393	0.398 7016	0.399 2585	273
13	0.149 6711	0.141 2985	1530	0.921 6643	0.922 8174	371	0.399 7872	0.400 2876	284
14	0.132 9163	0.124 5249	1541	0.923 9054	0.924 9282	349	0.400 7598	0.401 2038	294
15	0.116 1251	0.107 7174	1552	0.925 8859	0.926 7783	327	0.401 6195	0.402 0070	305
16	+0.099 3024	+0.090 8808	+ 1563	+0.927 6054	+0.928 3674	− 305	+0.402 3662	+0.402 6970	+ 316
17	0.082 4530	0.074 0197	1574	0.929 0641	0.929 6955	282	0.402 9995	0.403 2737	327
18	0.065 5814	0.057 1385	1584	0.930 2616	0.930 7625	259	0.403 5195	0.403 7370	338
19	0.048 6918	0.040 2420	1594	0.931 1981	0.931 5681	235	0.403 9262	0.404 0870	349
20	0.031 7894	0.023 3346	1603	0.931 8728	0.932 1124	211	0.404 2194	0.404 3235	360
21	+0.014 8781	+0.006 4204	+ 1612	+0.932 2866	+0.932 3954	-- 186	+0.404 3992	+0.404 4465	+ 371
22	−0.002 0378	−0.010 4958	1620	0.932 4388	0.932 4169	161	0.404 4655	0.404 4560	383
23	0.018 9531	0.027 4093	1628	0.932 3296	0.932 1769	136	0.404 4182	0.404 3519	394
24	0.035 8639	0.044 3162	1635	0.931 9588	0.931 6754	111	0.404 2573	0.404 1343	405
25	0.052 7656	0.061 2116	1642	0.931 3267	0.930 9126	86	0.403 9830	0.403 8033	416
26	−0.069 6537	−0.078 0912	+ 1648	+0.930 4331	+0.929 8883	- 61	+0.403 5952	+0.403 3586	+ 427
27	0.086 5236	0.094 9503	1654	0.929 2781	0.928 6026	35	0.403 0935	0.402 8002	438
28	0.103 3707	0.111 7843	1660	0.927 8617	0.927 0555	- 9	0.402 4785	0.402 1285	449
29	0.120 1905	0.128 5886	1665	0.926 1840	0.925 2473	+ 17	0.401 7502	0.401 3435	459
30	0.136 9780	0.145 3582	1669	0.924 2452	0.923 1778	43	0.400 9084	0.400 4451	470
31	0.153 7284	0.162 0882	+ 1673	+0.922 0452	+0.920 8475	+ 70	+0.399 9535	+0.399 4336	+ 480
32	−0.170 4370	−0.178 7740	+ 1676	+0.919 5847	+0.918 2567	+ 97	+0.398 8855	+0.398 3091	+ 491

FOR GREENWICH MEAN NOON AND MIDNIGHT.·

Date	X — True Equinox. Noon.	X — True Equinox. Midnight.	Reduc. to Mean Eq'x of Jan. 0, Noon.	Y — True Equinox Noon.	Y — True Equinox Midnight	Reduc. to Mean Eq'x of Jan. 0. Noon.	Z — True Equinox. Noon	Z — True Equinox. Midnight	Reduc. to Mean Eq'x of Jan. 0. Noon.
July 1	−0.153 7284	−0.162 0882	+ 1673	+0.922 0452	+0.920 8475	+ 70	+0.399 9535	+0.399 4336	+ 480
2	0.170 4370	0.178 7740	1676	0.919 5847	0.918 2567	97	0.398 8855	0.398 3091	491
3	0.187 0087	0.195 4102	1679	0.916 8637	0.915 4058	124	0.397 7046	0.397 0722	501
4	0.203 7081	0.211 9916	1681	0.913 8830	0.912 2954	152	0.396 4112	0.395 7224	512
5	0.220 2602	0.228 5133	1683	0.910 6432	0.908 9264	180	0.395 0056	0.394 2608	522
6	−0.236 7502	−0.244 9701	+ 1684	+0.907 1452	+0.905 2998	+ 208	+0.393 4881	+0.392 6877	+ 532
7	0.253 1725	0.261 3569	1685	0.903 3904	0.901 4170	236	0.391 8595	0.391 0036	542
8	0.269 5225	0.277 6688	1685	0.899 3798	0.897 2791	264	0.390 1200	0.389 2090	552
9	0.285 7951	0.293 9008	1685	0.895 1150	0.892 8878	293	0.388 2705	0.387 3046	562
10	0.301 9854	0.310 0484	1684	0.890 5977	0.888 2448	322	0.386 3115	0.385 2911	572
11	−0.318 0891	−0.326 1069	+ 1682	+0.885 8293	+0.883 3514	+ 351	+0.384 2436	+0.383 1892	+ 582
12	0.334 1017	0.342 0724	1680	0.880 8114	0.878 2095	380	0.382 0678	0.380 9395	592
13	0.350 0186	0.357 9398	1677	0.875 5460	0.872 8209	409	0.379 7845	0.378 6028	602
14	0.365 8356	0.363 7053	1673	0.870 0346	0.867 1873	438	0.377 3946	0.376 1599	612
15	0.381 5485	0.389 3646	1669	0.864 2791	0.861 3103	467	0.374 8988	0.373 6113	622
16	−0.397 1530	−0.404 9133	+ 1664	+0.858 2811	+0.855 1918	+ 496	+0.372 2975	+0.370 9578	+ 632
17	0.412 6449	0.420 3474	1659	0.852 0425	0.848 8335	525	0.369 5920	0.368 2002	641
18	0.428 0202	0.435 6629	1653	0.845 5650	0.842 2373	554	0.366 7826	0.365 3394	650
19	0.443 2749	0.440 8558	1646	0.838 8505	0.835 4049	584	0.363 8705	0.362 3760	659
20	0.458 4050	0.465 9220	1639	0.831 9007	0.828 3382	613	0.360 8560	0.359 3108	668
21	−0.473 4063	−0.480 8574	+ 1631	+0.824 7176	+0.821 0391	+ 642	+0.357 7403	+0.356 1446	+ 677
22	0.488 2749	0.495 6581	1622	0.817 3030	0.813 5095	672	0.354 5239	0.352 8782	686
23	0.503 0067	0.510 3202	1613	0.809 6588	0.805 7511	701	0.351 2077	0.349 5124	694
24	0.517 5981	0.524 8398	1603	0.801 7866	0.797 7658	730	0.347 7926	0.346 0483	703
25	0.532 0449	0.539 2128	1593	0.793 6887	0.789 5555	760	0.344 2796	0.342 4865	711
26	−0.546 3430	−0.553 4350	+ 1582	+0.785 3664	+0.781 1218	+ 789	+0.340 6691	+0.338 8276	+ 719
27	0.560 4884	0.567 5025	1571	0.776 8220	0.772 4671	818	0.336 9621	0.335 0728	727
28	0.574 4769	0.581 4110	1559	0.768 0574	0.763 5932	847	0.333 1597	0.331 2229	735
29	0.588 3044	0.595 1564	1546	0.759 0748	0.754 5023	876	0.329 2626	0.327 2789	742
30	0.601 9666	0.608 7343	1532	0.749 8761	0.745 1965	905	0.325 2719	0.323 2417	750
31	−0.615 4591	−0.622 1405	+ 1518	+0.740 4638	+0.735 6782	+ 934	+0.321 1886	+0.319 1127	+ 757
Aug. 1	0.628 7779	0.635 3706	1503	0.730 8401	0.725 9499	963	0.317 0140	0.314 8927	764
2	0.641 9183	0.648 4204	1488	0.721 0079	0.716 0144	991	0.312 7489	0.310 5829	771
3	0.654 8764	0.661 2857	1472	0.710 9699	0.705 8746	1019	0.308 3948	0.306 1847	778
4	0.667 6478	0.673 9624	1456	0.700 7290	0.695 5335	1047	0.303 9528	0.301 6993	785
5	−0.680 2288	−0.686 4465	+ 1439	+0.690 2884	+0.684 9942	+ 1075	+0.299 4244	+0.297 1282	+ 792
6	0.692 6151	0.698 7342	1421	0.679 6513	0.674 2601	1102	0.294 8109	0.292 4727	798
7	0.704 8034	0.710 8221	1403	0.668 8210	0.663 3345	1130	0.290 1137	0.287 7342	804
8	0.716 7899	0.722 7065	1384	0.657 8010	0.652 2208	1157	0.285 3342	0.282 9140	810
9	0.728 5714	0.734 3841	1365	0.646 5944	0.640 9224	1184	0.280 4738	0.278 0138	816
10	−0.740 1444	0.745 8518	+ 1345	+0.635 2050	+0.629 4426	+ 1211	+0.275 5341	+0.273 0350	+ 822
11	0.751 5060	0.757 1065	1324	0.623 6358	0.617 7849	1237	0.270 5165	0.267 9789	828
12	0.762 6529	0.768 1449	1303	0.611 8904	0.605 9526	1263	0.265 4223	0.262 8470	833
13	0.773 5821	0.778 9641	1281	0.599 9721	0.593 9492	1289	0.260 2531	0.257 6408	838
14	0.784 2906	0.789 5613	1259	0.587 8844	0.581 7780	1314	0.255 0102	0.252 3617	843
15	−0.794 7758	−0.799 9337	+ 1236	+0.575 6306	+0.569 4426	+ 1339	+0.249 6952	+0.247 0112	+ 848
16	−0.805 0346	−0.810 0782	+ 1213	+0.563 2144	+0.556 0463	+ 1364	+0.244 3096	+0.241 5907	+ 853

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date	X True Equinox.		Reduc. to Mean Eq'x of Jan. o Noon	Y True Equinox.		Reduc to Mean Eq x of Jan. o. Noon.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o. Noon.
	Noon	Midnight.	Noon	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Aug. 16	-0.805 0346	-0.810 0782	+ 1213	+0.563 2144	+0.556 9463	+ 1364	+0.244 3096	+0.241 5907	+ 853
17	0.815 0643	0.819 9925	1189	0.550 6387	0.544 2922	1389	0.238 8546	0.236 1017	858
18	0.824 8624	0.829 6736	1164	0.537 9072	0.531 4840	1413	0.233 3320	0.230 5457	862
19	0.834 4259	0.839 1190	1139	0.525 0231	0.518 5250	1437	0.227 7429	0.224 9240	866
20	0.843 7526	0.848 3262	1114	0.511 9900	0.505 4186	1460	0.222 0892	0.219 2384	870
21	-0.852 8396	-0.857 2924	+ 1088	+0.498 8110	+0.492 1678	+ 1483	+0.216 3720	+0.213 4900	+ 874
22	0.861 6843	0.866 0150	1062	0.485 4894	0.478 7763	1505	0.210 5928	0.207 6806	877
23	0.870 2842	0.874 4914	1035	0.472 0289	0.465 2475	1527	0.204 7534	0.201 8115	880
24	0.878 6363	0.882 7186	1008	0.458 4325	0.451 5845	1549	0.198 8550	0.195 8841	883
25	0.886 7380	0.890 6941	980	0.444 7038	0.437 7910	1571	0.192 8991	0.189 9003	886
26	-0.894 5868	-0.898 4153	+ 952	+0.430 8464	+0.423 8706	+ 1592	+0.186 8877	+0.183 8616	+ 888
27	0.902 1795	0.905 8790	923	0.416 8639	0.409 8269	1612	0.180 8221	0.177 7695	890
28	0.909 5136	0.913 0828	894	0.402 7601	0.395 6640	1632	0.174 7039	0.171 6256	892
29	0.916 5864	0.920 0240	864	0.388 5391	0.381 3859	1651	0.168 5349	0.165 4320	894
30	0.923 3953	0.926 7000	834	0.374 2048	0.366 9963	1670	0.162 3171	0.159 1903	895
31	0.929 9377	- 0.933 1082	+ 804	+0.359 7611	+0.352 4998	+ 1688	+0.156 0520	+0.152 9024	+896
Sept. 1	0.936 2111	0.939 2463	773	0.345 2129	0.337 9009	1706	0.149 7417	0.146 5702	897
2	0.942 2135	0.945 1121	742	0.330 5643	0.323 2037	1723	0.143 3881	0.140 1956	898
3	0.947 9422	0.950 7036	710	0.315 8197	0.308 4129	1740	0.136 9929	0.133 7804	899
4	0.953 3961	0.956 0193	678	0.300 9839	0.293 5332	1757	0.130 5582	0.127 3267	899
5	-0.958 5730	-0.961 0571	+ 646	+0.286 0615	+0.278 5693	+ 1773	+0.124 0860	+0.120 8364	+ 899
6	0.963 4715	0.965 8159	614	0.271 0572	0.263 5256	1788	0.117 5782	0.114 3116	899
7	0.968 0902	0.970 2942	581	0.255 9752	0.248 4065	1803	0.111 0368	0.107 7540	899
8	0.972 4277	0.974 4906	548	0.240 8201	0.233 2167	1818	0.104 4636	0.101 1658	898
9	0.976 4828	0.978 4041	514	0.225 5968	0.217 9608	1832	0.097 8607	0.094 5486	897
10	-0.980 2545	-0.982 0337	+ 480	+0.210 3093	+0.202 6429	+ 1846	+0.091 2297	+0.087 9044	+ 896
11	0.983 7417	0.985 3782	446	0.194 9622	0.187 2676	1859	0.084 5729	0.081 2354	895
12	0.986 9433	0.988 4370	411	0.179 5598	0.171 8394	1871	0.077 8921	0.074 5432	894
13	0.989 8590	0.991 2092	·376	0.164 1068	0.156 3625	1883	0.071 1889	0.067 8296	892
14	0.992 4875	0.993 6938	341	0.148 6072	0.140 8414	1894	0.064 4655	0.061 0968	890
15	-0.994 8281	-0.995 8903	+ 306	+0.133 0656	+0.125 2804	+ 1905	+0.057 7238	+0.054 3466	+ 888
16	0.996 8804	0.997 7982	271	0.117 4862	0.109 6835	1915	0.050 9654	0.047 5806	885
17	0.998 6437	0.999 4667	235	0.101 8731	0.094 0553	1925	0.044 1923	0.040 8008	882
18	1.000 1171	1.000 7450	199	0.086 2306	0.078 3996	1934	0.037 4063	0.034 0092	879
19	1.001 3003	1.001 7828	163	0.070 5629	0.062 7208	1943	0.030 6095	0.027 2074	876
20	-1.002 1926	-1.002 5295	+ 127	+0.054 8740	+0.047 0229	+ 1951	+0.023 8033	+0.020 3975	+ 872
21	1.002 7934	1.002 9842	91	0.039 1682	0.031 3104	1958	0.016 9900	0.013 5811	868
22	1.003 1019	1.003 1464	55	0.023 4500	+0.015 5874	1965	0.010 1711	+0.006 7602	864
23	1.003 1175	1.003 0162	+ 18	+0.007 7233	-0.000 1418	1971	+0.003 3487	-0.000 0631	860
24	1.002 8395	1.002 5902	- 18	-0.008 0073	0.015 8725	1977	-0.003 4751	0.006 8869	856
25	-1.002 2673	1.001 8708	- 55	-0.023 7369	-0.031 6001	+ 1982	-0.010 2984	-0.013 7093	+ 851
26	1.001 4005	1.000 8564	92	0.039 4614	0.047 3201	1986	0.017 1194	0.020 5282	846
27	1.000 2386	0.999 5470	129	0.055 1757	0.063 0276	1990	0.023 9356	0.027 3415	841
28	0.998 7815	0.997 9422	166	0.070 8751	0.078 7176	1993	0.030 7454	0.034 1471	835
29	0.997 0291	0.996 0421	204	0.086 5547	0.094 3855	1996	0.037 5463	0.040 9428	829
30	-0.994 9813	-0.993 8468	- 241	-0.102 2095	-0.110 0259	+ 1998	-0.044 3364	-0.047 7266	+ 823
31	-0.992 6385	-0.991 3565	- 279	-0.117 8343	-0.125 6339	+ 1999	-0.051 1133	-0.054 4962	+ 817

FOR GREENWICH MEAN NOON AND MIDNIGHT.

X		Reduc. to Mean Eq'x of Jan. o. Noon.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o. Noon.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o. Noon.
True Equinox.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
	0.9811 3595	− 279	−0.117 8343	−0.125 6339	+ 1999	−0.051 1133	−0.054 4902	
	0.9885 5720	310	0.133 4242	0.141 2045	2000	0.057 8751	0.061 2496	
	0.9854940	354	0.148 9743	0.156 7329	2000	0.064 6196	0.067 9847	
	0.9892 1232	391	0.164 4796	0.172 2139	1999	0.071 3447	0.074 6992	
	0.9978 4007	429	0.179 9352	0.187 6428	1998	0.078 0481	0.081 3913	
	0.974 5077	467	−0.195 3363	−0.203 0150	+ 1997	−0.084 7283	−0.088 0588	
	0.9970 2053	505	0.210 6783	0.218 3256	1995	0.091 3827	0.094 6997	
	0.9965 7347	543	0.225 9564	0.233 5701	1992	0.098 0095	0.101 3120	
	0.9960 9170	580	0.241 1661	0.248 7439	1989	0.104 6068	0.107 8937	
	0.9955 7451	615	0.256 3026	0.263 8421	1985	0.111 1725	0.114 4429	
	0.9950 4290	655	−0.271 3616	−0.278 8607	+ 1981	−0.117 7047	−0.120 9577	
	0.9944 7409	693	0.286 3387	0.293 7952	1976	0.124 2016	0.127 4362	
	0.9938 9126	730	0.301 2295	0.308 6411	1970	0.130 6612	0.133 8766	
	0.9932 5556	768	0.316 0296	0.323 3944	1964	0.137 0815	0.140 2764	
	0.9926 2517	805	0.330 7351	0.338 0510	1958	0.143 4609	0.146 6346	
	0.9919 9628	842	−0.345 3416	−0.352 6065	+ 1951	−0.149 7974	−0.152 9490	
	0.9914 2594	879	0.359 8452	0.367 0571	1944	0.156 0893	0.159 2180	
	0.9904 1200	910	0.374 2418	0.381 3988	1936	0.162 3349	0.165 4397	
	0.9897 3345	953	0.388 5275	0.395 6274	1927	0.168 5322	0.171 6123	
	0.9889 4700	990	0.402 6981	0.409 7390	1917	0.174 6796	0.177 7340	
	0.9882 5422	1027	−0.416 7495	−0.423 7291	+ 1907	−0.180 7751	−0.183 8025	
	0.9874 9457	1064	0.430 6774	0.437 5935	1896	0.186 8169	0.189 8171	
	0.9864 2924	1100	0.444 4777	0.451 3286	1885	0.192 8031	0.195 7748	
	0.9858 0752	1136	0.458 1459	0.464 9200	1873	0.198 7319	0.201 6741	
	0.9845 9942	1172	0.471 6774	0.478 3906	1860	0.204 6012	0.207 5130	
	0.9837 7889	1208	−0.485 0680	−0.491 7090	+ 1847	−0.210 4092	−0.213 2806	
	0.9827 7589	1244	0.498 3130	0.504 8795	1833	0.216 1540	0.219 0021	
	0.9817 3499	1280	0.511 4080	0.517 8980	1819	0.221 8336	0.224 6483	
	0.9806 9570	1315	0.524 3488	0.530 7509	1804	0.227 4461	0.230 2267	
	0.9796 5290	1350	0.537 1307	0.543 4608	1788	0.232 9898	0.235 7352	
	0.9785 6527	1385	0.549 7495	0.555 9964	+ 1772	−0.238 4626	−0.241 1722	
	0.9774 6890	1420	0.562 2010	0.568 3628	1755	0.243 8630	0.246 5354	
	0.9763 7990	1454	0.574 4812	0.580 5558	1738	0.249 1891	0.251 8238	
	0.9752 4290	1488	0.586 5860	0.592 5714	1720	0.254 4392	0.257 0352	
	0.9740 8090	1522	0.598 5113	0.604 4050	1702	0.259 6116	0.262 1082	
	0.9728 9169	1556	−0.610 2527	−0.616 0545	+ 1683	−0.264 7047	−0.267 2210	
	0.9717 9236	1590	0.621 8092	0.627 5159	1664	0.269 7169	0.272 1922	
	0.9704 8590	1622	0.633 1744	0.638 7844	1644	0.274 6467	0.277 0802	
	0.9693 8529	1655	0.644 3455	0.649 8574	1624	0.279 4925	0.281 8836	
	0.9681 9770	1687	0.655 3195	0.660 7315	1603	0.284 2531	0.286 6009	
	0.9668 3555	1719	−0.666 0929	−0.671 4034	+ 1581	−0.288 9267	−0.291 2304	
	0.9657 3531	1751	0.676 6627	0.681 8703	1559	0.293 5119	0.295 7710	
	0.9645 4323	1783	0.687 0258	0.692 1288	1536	0.298 0076	0.300 2214	
	0.9633 5421	1814	0.697 1791	0.702 1764	1512	0.302 4124	0.304 5503	
	0.9621 4946	1845	0.707 1202	0.712 0100	1488	0.306 7251	0.308 8465	
	0.9594 1449	1876	−0.716 8457	−0.721 6269	+ 1464	−0.310 9444	−0.313 0187	
	0.9584 2449	1906	0.726 3533	0.731 0244	1439	0.315 0689	0.317 0952	

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X — True Equinox. Noon.	X — True Equinox. Midnight.	Reduc. to Mean Eq'x of Jan. 0. Noon.	Y — True Equinox. Noon.	Y — True Equinox. Midnight.	Reduc. to Mean Eq'x of Jan. 0. Noon.	Z — True Equinox. Noon.	Z — True Equinox. Midnight.	Reduc. to Mean Eq'x of Jan. 0. Noon.
Nov. 16	−0.592 0955	−0.585 0463	− 1906	−0.726 3533	−0.731 0244	+ 1439	−0.315 0689	−0.317 0952	+ 264
17	0.577 9521	0.570 8139	1936	0.735 6400	0.740 1995	1413	0.319 0977	0.321 0756	247
18	0.563 6319	0.556 4067	1965	0.744 7030	0.749 1498	1387	0.323 0291	0.324 9580	230
19	0.549 1387	0.541 8285	1994	0.753 5395	0.757 8717	1360	0.326 8622	0.328 7414	213
20	0.534 4765	0.527 0833	2022	0.762 1462	0.766 3626	1333	0.330 5955	0.332 4243	196
21	−0.519 6493	−0.512 1751	2050	−0.770 5205	−0.774 6195	+ 1305	−0.334 2277	−0.336 0055	+ 179
22	0.504 6612	0.497 1080	2078	0.778 6592	0.782 6394	1276	0.337 7576	0.339 4838	161
23	0.489 5164	0.481 8865	2105	0.786 5595	0.790 4189	1247	0.341 1840	0.342 8578	144
24	0.474 2191	0.466 5152	2132	0.794 2177	0.797 9559	1218	0.344 5052	0.346 1264	126
25	0.458 7750	0.450 9989	2158	0.801 6328	0.805 2477	1188	0.347 7210	0.349 2885	108
26	−0.443 1877	−0.435 3420	− 2183	−0.808 8004	−0.812 2907	+ 1158	−0.350 8291	−0.352 3427	+ 90
27	0.427 4625	0.419 5497	2208	0.815 7183	0.819 0828	1127	0.353 8292	0.355 2882	72
28	0.411 6042	0.403 6268	2233	0.822 3839	0.825 6213	1095	0.356 7198	0.358 1237	54
29	0.395 6181	0.387 5786	2257	0.828 7948	0.831 9040	1063	0.359 4999	0.360 8483	36
30	0.379 5091	0.371 4102	2281	0.834 9489	0.837 9289	1030	0.362 1688	0.363 4612	+ 17
Dec. 1	−0.363 2826	−0.355 1268	− 2304	−0.840 8439	−0.843 6937	+ 997	−0.364 7254	−0.365 9613	− 1
2	0.346 9436	0.338 7336	2327	0.846 4780	0.849 1965	963	0.367 1689	0.368 3480	20
3	0.330 4976	0.322 2361	2349	0.851 8491	0.854 4355	929	0.369 4985	0.370 6203	38
4	0.313 9499	0.305 6397	2371	0.856 9555	0.859 4090	894	0.371 7134	0.372 7777	57
5	0.297 3061	0.288 9495	2392	0.861 7957	0.864 1155	859	0.373 8130	0.374 8193	75
6	−0.280 5708	−0.272 1708	− 2412	−0.866 3682	−0.868 5536	+ 823	−0.375 7966	−0.376 7448	− 94
7	0.263 7501	0.255 3093	2431	0.870 6717	0.872 7222	787	0.377 6637	0.378 5533	112
8	0.246 8492	0.238 3703	2450	0.874 7050	0.876 6200	750	0.379 4136	0.380 2445	131
9	0.229 8734	0.221 3591	2468	0.878 4670	0.880 2460	712	0.381 0460	0.381 8179	150
10	0.212 8281	0.204 2809	2486	0.881 9568	0.883 5993	674	0.382 5603	0.383 2731	169
11	−0.195 7183	−0.187 1409	− 2503	−0.885 1735	−0.886 6792	+ 635	−0.383 9563	−0.384 6098	− 187
12	0.178 5494	0.169 9444	2519	0.888 1165	0.889 4852	596	0.385 2336	0.385 8276	206
13	0.161 3265	0.152 6963	2534	0.890 7852	0.892 0164	557	0.386 3917	0.386 9260	225
14	0.144 0545	0.135 4016	2549	0.893 1788	0.894 2724	517	0.387 4304	0.387 9050	244
15	0.126 7382	0.118 0651	2563	0.895 2970	0.896 2525	477	0.388 3496	0.388 7641	263
16	−0.109 3828	−0.100 6918	− 2576	−0.897 1388	−0.897 9560	+ 436	−0.389 1486	−0.389 5030	− 282
17	0.091 9929	0.083 2866	2588	0.898 7038	0.899 3822	395	0.389 8274	0.390 1216	301
18	0.074 5736	0.065 8544	2600	0.899 9910	0.900 5303	354	0.390 3857	0.390 6195	320
19	0.057 1298	0.048 4005	2611	0.900 9999	0.901 3997	312	0.390 8231	0.390 9963	339
20	0.039 6670	0.030 9299	2621	0.901 7297	0.901 9898	270	0.391 1392	0.391 2517	358
21	−0.022 1899	− 0.013 4479	− 2630	−0.902 1798	−0.902 2997	+ 228	−0.391 3339	−0.391 3856	− 377
22	−0.004 7045	+0.004 0397	2639	0.902 3495	0.902 3291	185	0.391 4069	0.391 3977	395
23	+0.012 7840	0.021 5277	2647	0.902 2385	0.902 0776	142	0.391 3580	0.391 2879	414
24	0.030 2701	0.039 0105	2654	0.901 8463	0.901 5447	99	0.391 1873	0.391 0562	433
25	0.047 7481	0.056 4823	2660	0.901 1728	0.900 7305	55	0.390 8946	0.390 7024	452
26	+0.065 2123	+0.073 9374	− 2666	−0.900 2179	−0.899 6349	+ 11	−0.390 4797	−0.390 2266	− 471
27	0.082 6569	0.091 3702	2670	0.898 9817	0.898 2582	− 33	0.389 9431	0.389 6290	490
28	0.100 0764	0.108 7749	2673	0.897 4645	0.896 6006	77	0.389 2845	0.388 9096	508
29	0.117 4650	0.126 1460	2676	0.895 6666	0.894 6625	122	0.388 5044	0.388 0688	527
30	0.134 8171	0.143 4776	2678	0.893 5885	0.892 4446	167	0.387 6029	0.387 1067	545
31	+0.152 1267	+0.160 7638	− 2679	−0.891 2309	−0.889 9476	− 212	−0.386 5802	−0.386 0237	− 564
32	+0.169 3883	+0.177 9993	− 2678	−0.888 5947	−0.887 1724	− 258	−0.385 4370	−0.384 8201	− 582

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY. True Longitude.	Latitude.	Day of Month.	FEBRUARY. True Longitude.	Latitude.	Day of Month.	MARCH. True Longitude.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	188 14 28.9	− 2 49 56.3	1.0	231 59 59.1	+ 1 09 27.5	1.0	239 46 43.2	+ 2 04 35.4
1.5	194 18 48 4	2 21 52.2	1.5	237 53 33.3	1 39 26.4	1.5	245 40 57.9	2 32 55.0
2.0	200 19 32.1	1 52 29.6	2.0	243 47 31.1	2 08 22.2	2.0	251 35 33.2	2 59 38 0
2.5	206 17 21.0	1 22 07.6	2.5	249 42 31.8	2 35 58.6	2.5	257 31 09.3	3 24 29 4
3.0	212 12 56.3	0 51 04.1	3.0	255 39 12.0	3 01 59.5	3.0	263 28 26.2	3 47 14 5
3.5	218 06 59.0	− 0 19 37.0	3.5	261 38 05.7	+ 3 26 08.3	3.5	269 28 02.2	+ 4 07 38 5
4.0	224 00 08.4	+ 0 11 56 5	4.0	267 39 43.5	3 48 08.6	4.0	275 30 34.0	4 25 26 7
4.5	229 53 01.6	0 43 18.8	4.5	273 44 31.8	4 07 43.7	4.5	281 36 35.2	4 40 24.2
5.0	235 46 13.3	1 14 12.7	5.0	279 52 52.8	4 24 37.1	5 0	287 46 36.3	4 52 16.8
5.5	241 40 15.4	1 44 20.7	5.5	286 05 03.8	4 38 32 8	5.5	294 01 04.0	5 00 50 0
6.0	247 35 37.4	+ 2 13 25.0	6 0	292 21 17.4	+ 4 49 15.2	6.0	300 20 19.3	+ 5 05 50.4
6.5	253 32 44.7	2 41 07.8	6.5	298 41 40.5	4 56 30.8	6.5	306 44 38 4	5 07 06.2
7.0	259 31 59 4	3 07 10 9	7.0	305 06 15.1	5 00 07.0	7.0	313 14 10.9	5 04 26.9
7.5	265 33 40.1	3 31 16.4	7.5	311 34 57.9	4 59 53 9	7.5	319 49 00.5	4 57 45.0
8.0	271 38 01.8	3 53 06.4	8.0	318 07 40.7	4 55 44.4	8.0	326 29 03.5	4 46 55 7
8.5	277 45 15.5	+ 4 12 23.6	8.5	324 44 11.6	+ 4 47 34.7	8.5	333 14 09.7	+ 4 31 58 5
9.0	283 55 29.1	4 28 51.5	9 0	331 24 15 4	4 35 24.8	9.0	340 04 02.3	4 12 57.7
9.5	290 08 46.8	4 42 14.3	9 5	338 07 34.0	4 19 19.2	9.5	346 58 18.6	3 50 02.3
10 0	296 25 10.8	4 52 18.6	10.0	344 53 48.2	3 59 26.5	10.0	353 56 30.9	3 23 26 9
10.5	302 44 40.1	4 58 52.0	10.5	351 42 38.2	3 35 59.6	10.5	0 58 07.1	2 53 32 0
11.0	309 7 12.3	+ 5 01 44.7	11.0	358 33 45.1	+ 3 09 16.0	11.0	8 02 33.2	+ 2 20 42 5
11.5	315 32 43.7	5 00 49.6	11 5	5 26 51 1	2 39 36.8	11.5	15 09 13.1	1 45 28 8
12.0	322 01 10 2	4 56 02.3	12.0	12 21 41.1	2 07 26.9	12.0	22 17 31.1	1 08 25.1
12.5	328 32 27.8	4 47 21.3	12.5	19 18 01.7	1 33 14.0	12.5	29 26 52.8	+ 0 30 08 6
13.0	335 06 33 5	4 34 48.7	13.0	26 15 42.1	0 57 29 1	13.0	36 36 45.8	− 0 08 41 7
13.5	341 43 25.2	+ 4 18 29.5	13.5	33 14 34.7	+ 0 20 44.2	13.5	43 46 41.0	− 0 47 26 1
14.0	348 23 02.4	3 58 32.0	14.0	40 14 33.5	0 16 26.6	14.0	50 56 12.6	1 25 25 0
14.5	355 05 26.5	3 35 08.2	14 5	47 15 34.1	0 53 29.1	14.5	58 04 58.3	2 02 00 5
15 0	1 50 40.4	3 08 33.2	15.0	54 17 32.1	1 29 48.0	15.0	65 12 39 9	2 36 37 0
15.5	8 38 48.6	2 39 05.4	15 5	61 20 23.5	2 04 49.2	15 5	72 19 01.7	3 08 41 8
16.0	15 29 56.3	+ 2 07 06.3	16.0	68 24 02.5	2 37 59 2	16.0	79 23 51.2	− 3 37 45 0
16.5	22 24 08.9	1 33 00.7	16.5	75 28 20.9	3 08 46.0	16.5	86 26 58.1	4 03 24 1
17.0	29 21 30 8	0 57 16.4	17.0	82 33 08.5	3 36 39.6	17.0	93 28 12.6	4 25 15 4
17.5	36 22 04.9	+ 0 20 24.1	17 5	89 38 08.8	4 01 13.1	17.5	100 27 26.4	4 43 03 0
18 0	43 25 50.9	0 17 03.2	18.0	96 43 04.2	4 22 03.1	18.0	107 24 31.5	4 56 34 0
18 5	50 32 44.2	− 0 54 29.7	18.5	103 47 31.9	− 4 38 49 7	18 5	114 19 19.7	− 5 05 42 5
19 0	57 42 35 0	1 31 18.6	19.0	110 51 04.8	4 51 18.2	19 0	121 11 41.6	5 10 22 7
19.5	64 55 07.0	2 06 51.7	19.5	117 53 13.2	4 59 18.5	19 5	128 01 28.0	5 10 36 1
20.0	72 09 56.5	2 40 31.0	20 0	124 53 25.1	5 02 46.2	20.0	134 48 29.6	5 06 27 5
20 5	79 26 32.8	3 11 39 4	20.5	131 51 07 5	5 01 42 1	20.5	141 32 35.6	4 58 05 6
21 0	86 44 17 6	3 39 42.3	21.0	138 45 48.0	4 56 12 0	21.0	148 13 36.2	− 4 45 42 4
21.5	94 02 26.2	4 04 08.6	21.5	145 36 55.9	4 46 27 3	21 5	154 51 21.5	4 29 33 4
22 0	101 20 08.6	4 24 32 1	22.0	152 24 03.9	4 32 43 5	22 0	161 25 42 7	4 09 57 3
22.5	108 36 31.0	4 40 32.4	22.5	159 06 48 8	4 15 19 6	22 5	167 56 32.1	3 47 14 4
23 0	115 50 39 0	4 51 55.8	23.0	165 44 52.9	3 54 37 5	23.0	174 23 44.6	3 21 47 4
23.5	123 01 38.8	− 4 58 35.2	23.5	172 18 04.8	3 31 01 3	23.5	180 47 16.8	− 2 54 00 4
24 0	130 08 40.4	5 00 30 9	24.0	178 46 19.0	3 04 56 2	24 0	187 07 08.4	2 24 17 8
24 5	137 10 59 4	4 57 49.3	24.5	185 09 37.0	2 36 47 9	24 5	193 23 22.0	1 53 04 8
25 0	144 07 58 6	4 50 42 9	25.0	191 28 06 3	2 07 01 7	25.0	199 36 03 8	1 20 46.0
25.5	150 59 09.9	4 39 28 4	25 5	197 42 00 4	1 36 02.4	25.5	205 45 23.3	0 47 45 8
26 0	157 44 14 3	− 4 24 26 1	26 0	203 51 38 5	1 04 13 7	26 0	211 51 33.3	0 14 27 3
26 5	164 23 02 7	4 05 59 6	26.5	209 57 24 8	− 0 31 58 1	26 5	217 54 49.9	+ 0 18 47 3
27 0	170 55 35 1	3 44 33 1	27 0	215 59 47 3	+ 0 00 23 7	27 0	223 55 32 8	0 51 36 8
27.5	177 22 00.6	3 20 31.5	27 5	221 59 18 4	0 32 31 8	27 5	229 54 04.8	1 23 41 7
28.0	183 42 36 0	2 54 19.4	28 0	227 56 32 0	1 04 07 8	28 0	235 50 51 6	1 54 43 8
28.5	189 57 45 0	− 2 26 21.1	28 5	233 52 08 2	+ 1 34 54 5	28 5	241 46 21.5	+ 2 24 25 7
29 0	196 07 56.7	1 56 59 5	29 0	239 46 43 2	2 04 35 4	29 0	247 41 05.0	2 52 31 4
29.5	202 13 45 2	1 26 36 0	29 5	245 40 57 9	2 32 55 0	29 5	253 35 34.7	3 18 46 0
30.0	208 15 47 8	0 55 31 5	30 0	251 35 33.2	2 59 38 0	30 0	259 30 25 3	3 42 54 0
30 5	214 14 44 5	− 0 24 05 0	30 5	257 31 09 3	3 24 29 4	30 5	265 26 12 5	4 04 44 5
31 0	220 11 16 9	+ 0 07 25 2	31 0	263 28 26 2	+ 3 47 14 5	31.0	271 23 32 8	+ 4 24 01 6
31.5	226 06 07 6	+ 0 38 41.6	31 5	269 28 02 2	+ 4 07 38 5	31 5	277 23 02 8	+ 4 40 33 1

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL. True Longitude.	Latitude.	Day of Month.	MAY. True Longitude.	Latitude.	Day of Month.	JUNE. True Longitude.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	283 25 19.3	+ 4 54 06 5	1.0	316 28 11.2	+ 5 10 30.8	1.0	4 47 38.0	+ 2 31 56.0
1.5	289 30 58.9	5 04 29.2	1 5	322 50 42.1	5 01 13.3	1.5	11 43 31.4	1 57 50.3
2.0	295 40 35.6	5 11 29.3	2.0	329 18 46.9	4 48 00.3	2.0	18 46 01 6	1 21 26.2
2.5	301 51 41 6	5 14 55.6	2.5	335 52 49.4	4 30 50.5	2.5	25 55 03.7	0 43 13.3
3 0	308 13 46.2	5 14 37.2	3.0	342 33 09.3	4 09 46.2	3.0	33 10 23 7	+ 0 03 47.0
3.5	314 38 15.0	+ 5 10 25.0	3.5	349 20 00.1	+ 3 44 53.1	3.5	40 31 35.9	− 0 36 12.9
4.0	321 08 28.7	5 02 11.4	4.0	356 13 28.8	3 16 21.5	4.0	47 58 03.0	1 16 02.5
4.5	327 44 41.7	4 49 51.6	4.5	3 13 34.0	2 44 27.3	4.5	55 28 56.8	1 54 54.1
5.0	334 27 02.2	4 33 23.7	5.0	10 20 05.7	2 09 32.3	5.0	63 03 17.6	2 31 59.5
5.5	341 15 31.0	4 12 50.1	5.5	17 32 43.7	1 32 04.3	5.5	70 39 56.6	3 06 31.9
6.0	348 10 00 9	+ 3 48 18.0	6.0	24 50 58.3	+ 0 52 37.5	6.0	78 17 38.4	− 3 37 47.0
6.5	355 10 16.2	3 20 00.4	6.5	32 14 09.3	+ 0 11 52.2	6.5	85 55 03.6	4 05 05.7
7.0	2 15 53.3	2 48 15.8	7.0	39 41 27.3	− 0 29 27.2	7.0	93 30 52.5	4 27 57.0
7.5	9 26 20.4	2 13 29.9	7.5	47 11 54.9	1 10 32.7	7.5	101 03 48 2	4 45 57.7
8.0	16 40 58.1	1 36 13.7	8.0	54 44 27.8	1 50 34.3	8.0	108 32 40.1	4 58 53.6
8.5	23 59 02.1	+ 0 57 03.9	8.5	62 17 57.9	− 2 28 43.4	8.5	115 56 26 9	− 5 06 39.5
9.0	31 19 42.9	+ 0 16 42.3	9.0	69 51 15.3	3 04 13.7	9.0	123 14 18.6	5 09 18.6
9.5	38 42 07.7	− 0 24 05.8	9.5	77 23 11.0	3 36 24.0	9.5	130 25 37.2	5 07 00 9
10.0	46 05 23.7	1 04 37.4	10.0	84 52 40.1	4 04 39.2	10.0	137 29 57.6	5 00 02.8
10.5	53 28 38.2	1 44 03 4	10.5	92 18 42.8	4 28 32.4	10.5	144 27 06.9	4 48 44.2
11.0	60 51 00 9	− 2 21 40 8	11.0	99 40 27.7	− 4 47 44.1	11 0	151 17 03.7	− 4 33 28.6
11.5	68 11 45 7	2 56 49 2	11.5	106 57 12.6	5 02 02.4	11.5	157 59 56.5	4 14 41 0
12.0	75 30 11.3	3 28 52.6	12.0	114 08 25.4	5 11 24.0	12.0	164 36 01.4	3 52 47.0
12.5	82 45 42.2	3 57 21.0	12.5	121 13 44.0	5 15 51.1	12.5	171 05 42.2	3 28 12.4
13 0	89 57 49.3	4 21 50.1	13.0	128 12 55.7	5 15 32.2	13.0	177 29 26.8	3 01 22.4
13.5	97 06 09.3	− 4 42 01.7	13.5	135 05 56.6	− 5 10 39.8	13.5	183 47 46.9	− 2 32 41.7
14 0	104 10 25.7	4 57 43.6	14.0	141 52 50.4	5 01 30.0	14.0	190 01 16.8	2 02 33.7
14 5	111 10 27.2	5 08 49.4	14.5	148 33 48.2	4 48 21.4	14.5	196 10 31.5	1 31 20.5
15 0	118 06 07.3	5 15 17 7	15.0	155 09 05.2	4 31 34.4	15.0	202 16 05.9	0 59 24.0
15.5	124 57 24.1	5 17 11.4	15.5	161 39 01.0	4 11 30 5	15.5	208 18 34.9	− 0 27 04.6
16.0	131 44 19.2	− 5 14 37.6	16.0	168 03 57.7	− 3 48 31.3	16 0	214 18 31.7	+ 0 05 17.6
16.5	138 26 57.1	5 07 46.4	16.5	174 24 20.1	3 22 59.5	16.5	220 16 27.7	0 37 23.5
17 0	145 05 24 2	4 56 51.4	17.0	180 40 33.2	2 55 17.4	17 0	226 12 52.7	1 08 54.4
17.5	151 39 48.3	4 42 08.1	17.5	186 53 02.4	2 25 47.6	17.5	232 08 13.5	1 39 32.5
18.0	158 10 19.3	4 23 54.0	18.0	193 02 12 5	1 54 51.9	18.0	238 02 55.3	2 09 00 2
18.5	164 37 06.4	− 4 02 28.6	18.5	199 08 27.6	− 1 22 52.4	18.5	243 57 20 4	+ 2 37 00 5
19.0	171 00 20.0	3 38 12.4	19.0	205 12 11.2	0 50 10.7	19.0	249 51 49.0	3 03 17.3
19.5	177 20 10.6	3 11 27.3	19 5	211 13 44.7	− 0 17 08.0	19.5	255 46 38 5	3 27 34.6
20.0	183 36 48.4	2 42 35 9	20.0	217 13 28.7	+ 0 15 54.7	20 0	261 42 05.1	3 49 37.5
20.5	189 50 24.1	2 12 01.2	20.5	223 11 42.2	0 48 37.0	20 5	267 38 22.6	4 09 12 2
21.0	196 01 08.6	− 1 40 06.6	21.0	229 08 43.0	+ 1 20 39.2	21 0	273 35 43.5	+ 4 26 05 8
21.5	202 09 12.7	1 07 15.5	21.5	235 04 47.9	1 51 41.9	21.5	279 34 19 6	4 40 06.5
22.0	208 14 48 1	0 33 50.8	22.0	241 00 12 7	2 21 26.7	22.0	285 34 21.5	4 51 04·0
22.5	214 18 06 9	− 0 00 15.3	22 5	246 55 13.1	2 49 36 1	22.5	291 35 59.8	4 58 49.2
23.0	220 19 22 1	+ 0 33 09.2	23.0	252 50 03.9	3 15 53.4	23.0	297 39 25.6	5 03 14 8
23.5	226 18 47.8	+ 1 06 01 6	23.5	258 45 00.1	+ 3 40 03 4	23.5	303 44 50 1	+ 5 04 15.0
24.0	232 16 39 3	1 38 01.8	24.0	264 40 16.9	4 01 51.2	24.0	309 52 25.6	5 01 46.2
24.5	238 13 13 6	2 08 50 9	24 5	270 36 10.5	4 21 04.0	24.5	316 02 26.1	4 55 45.9
25.0	244 08 48 8	2 38 11.3	25 0	276 32 57.6	4 37 29.2	25.0	322 15 06.4	4 46 13 8
25.5	250 03 44 7	3 05 45.9	25 5	282 30 55.9	4 50 56.1	25.5	328 30 43.1	4 33 11 5
26 0	255 58 23.0	+ 3 31 19 5	26.0	288 30 25.0	+ 5 01 15.0	26.0	334 49 35.2	+ 4 16 42.7
26.5	261 53 07 7	3 54 37.6	26.5	294 31 45.6	5 08 17.5	26 5	341 12 02.6	3 56 53.3
27 0	267 48 24 0	4 15 27 0	27.0	300 35 19 6	5 11 56.2	27.0	347 38 26 5	3 33 51.1
27.5	273 44 39 0	4 33 34 9	27.5	306 41 31.2	5 12 05.0	27.5	354 09 08 7	3 07 47 2
28.0	279 42 21.1	4 48 50 0	28 0	312 50 45 4	5 08 39.1	28.0	0 44 31.1	2 38 54 8
28.5	285 42 00 7	+ 5 01 01 3	28 5	319 03 28 9	+ 5 01 35.0	28 5	7 24 55 4	+ 2 07 30 5
29 0	291 44 09 1	5 09 58 5	29.0	325 20 08.7	4 50 50 7	29.0	14 10 41 0	1 33 54 1
29 5	297 49 17 9	5 15 32 4	29.5	331 41 12.6	4 36 26 1	29 5	21 02 04.2	0 58 29 2
30 0	303 57 59 9	5 17 34 1	30 0	338 07 08.1	4 18 22.7	30 0	27 59 16.8	+ 0 21 43.1
30.5	310 10 47 2	5 15 55 9	30 5	344 38 21.7	3 56 45.1	30 5	35 02 24 7	− 0 15 52 7
31 0	316 28 11 2	+ 5 10 30.8	31 0	351 15 17.5	+ 3 31 40.4	31 0	42 11 26 0	− 0 53 43.1
31.5	322 50 42 1	+ 5 01 13.3	31.5	357 58 17.1	+ 3 03 19.0	31 5	49 26 09 7	− 1 31 09.8

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY. True Longitude.	Latitude.	Day of Month.	AUGUST. True Longitude.	Latitude.	Day of Month.	SEPTEMBER. True Longitude.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	42 11 26.0	− 0 53 43.1	1.0	95 49 25.0	− 4 37 01.6	1.0	148 42 18.9	−4 19 33 2
1.5	49 26 09.7	1 31 09.8	1.5	103 14 56.7	4 49 58.2	1.5	155 42 44.0	3 57 32.4
2.0	56 46 14.4	2 07 31.6	2.0	110 40 33.3	4 58 00.8	2.0	162 38 43.9	3 32 12.3
2.5	64 11 06.7	2 42 05.6	2.5	118 05 10.1	5 01 01.1	2.5	169 29 51 5	3 04 03.0
.3.0	71 40 01.9	3 14 09.1	3.0	125 27 41.0	4 58 58.9	3 0	176 15 46.4	2 33 36.0
3.5	79 12 04.5	− 3 43 01.0	3.5	132 47 02.6	− 4 52 01 6	3.5	182 56 15.5	− 2 01 23.7
4 0	86 46 08.6	4 08 03.6	4.0	140 02 16.6	4 40 23.7	4.0	189 31 13.5	1 27 57.1
4.5	94 21 01.1	4 28 45.1	4.5	147 12 31.6	4 24 26.1	4.5	196 00 42.8	0 53 46 8
5.0	101 55 24.1	4 44 40.4	5.0	154 17 06 2	4 04 34.2	5.0	202 24 52.2	− 0 19 20 8
5 5	109 27 59.0	4 55 33.1	5.5	161 15 28.8	3 41 17.3	5.5	208 43 56.6	+ 0 14 54 5
6 0	116 57 29.3	− 5 01 15.1	6.0	168 07 19.3	− 3 15 06.0	6.0	214 58 17 1	+ 0 48 35.3
6.5	124 22 44.7	5 01 47.8	6.5	174 52 28.1	2 46 32.3	6.5	221 08 18 9	1 21 20.1
7.0	131 42 43.9	4 57 20.3	7.0	181 30 56.3	2 16 07.5	7.0	227 14 31.3	1 52 49.7
7.5	138 56 36.7	4 48 08.8	7.5	188 02 53.8	1 44 21.7	7.5	233 17 27.1	2 22 46 9
8.0	146 03 45.4	4 34 34.9	8.0	194 28 38 7	1 11 43.4	8.0	239 17 40.9	2 50 56.4
8.5	153 03 45.6	−4 17 04.6	8.5	200 48 35.7	− 0 38 38.8	8.5	245 15 49.2	+3 17 04.0
9.0	159 56 25.1	3 56 05.9	9.0	207 03 15.2	− 0 05 32.2	9.0	251 12 29 6	3 40 57.4
9.5	166 41 44.1	3 32 08.3	9.5	213 13 11.4	+ 0 27 14.7	9.5	257 08 20.3	4 02 24.9
10.0	173 19 52.9	3 05 41.3	10.0	219 19 01.2	0 59 21.8	10.0	263 03 59.1	4 21 15.4
10.5	179 51 10 4	2 37 13.4	10.5	225 21 23.9	1 30 31.0	10.5	269 00 03.2	4 37 18.9
11.0	186 16 03.0	− 2 07 12.0	11.0	231 20 59.5	+ 2 00 25.3	11.0	274 57 08 5	+4 50 25.7
11.5	192 35 02 2	1 36 02.7	11.5	237 18 28.1	2 28 49.7	11.5	280 55 49.7	5 00 26.6
12.0	198 48 43.6	1 04 09.7	12.0	243 14 29.5	2 55 29 8	12.0	286 56 38.8	5 07 13 1
12.5	204 57 45 3	0 31 55.2	12.5	249 09 42.0	3 20 11.8	12.5	293 00 05.5	5 10 37.3
13.0	211 02 46 6	+ 0 00 20.1	13.0	255 04 42.7	3 42 42.9	13.0	299 06 36.5	5 10 32.2
13.5	217 04 27.6	+ 0 32 16.8	13.5	261 00 06.1	+ 4 02 50.8	13.5	305 16 34.5	+ 5 06 52.0
14.0	223 03 27.6	1 03 36.7	14.0	266 56 24.4	4 20 23.3	14.0	311 30 18.7	4 59 32.8
14.5	229 00 21 0	1 34 02.7	14.5	272 54 07.0	4 35 09.1	14.5	317 48 04.0	4 48 32 1
15.0	234 55 56.0	2 03 18.5	15.0	278 53 39.7	4 46 57.2	15.0	324 10 00.8	4 33 50 4
15.5	240 50 35.3	2 31 08.2	15.5	284 55 25.5	4 55 37.9	15.5	330 36 14.7	4 15 30.8
16.0	246 44 54.7	+ 2 57 16.7	16.0	290 59 42.9	+ 5 01 01.8	16.0	337 06 46.9	+ 3 53 4 .2
16.5	252 39 23.1	3 21 29.2	16.5	297 06 47.6	5 03 01.3	16.5	343 41 34.0	3 28 28 6
17.0	258 34 26.7	3 43 31.9	17.0	303 16 50.9	5 01 29.9	17.0	350 20 28.6	3 00 10.7
17.5	264 30 28.3	4 03 10.9	17.5	309 30 01.0	4 56 23.7	17.5	357 03 19.3	2 29 05.3
18.0	270 27 47.9	4 20 13.4	18.0	315 46 22.4	4 47 40.2	18.0	3 49 51 5	1 55 34.7
18.5	276 26 42.1	+4 34 27.2	18.5	322 05 56.9	+ 4 35 20.4	18.5	10 39 47.9	+ 1 20 06 0
19.0	282 27 24.9	4 45 41.5	19.0	328 28 43.5	4 19 27.4	19.0	17 32 49 7	0 43 09 3
19.5	288 30 07.5	4 53 46.2	19.5	334 54 39.2	4 00 07.9	19 5	24 28 36.5	+ 0 05 17.6
20.0	294 34 58.5	4 58 33.1	20.0	341 23 39.7	3 37 31.7	20.0	31 26 47.7	0 32 53 8
20.5	300 42 05.0	4 59 55.5	20.5	347 55 39.7	3 11 52.1	20.5	38 27 02.1	1 10 48.0
21.0	306 51 32 1	+4 57 48.7	21.0	354 30 33.8	+ 2 43 25.8	21.0	45 28 59.9	1 47 48.3
21.5	313 03 24.2	4 52 10.1	21.5	1 08 16.9	2 12 32.5	21 5	52 32 21.8	2 23 18.1
22.0	319 17 45.0	4 42 59.3	22.0	7 48 44.5	1 31 34.9	22.0	59 36 49.4	2 57 42 1
22.5	325 34 38.4	4 30 18.9	22.5	14 31 53.7	1 04 58.6	22.5	66 42 05.3	3 27 27 4
23.0	331 54 08.9	4 14 13.2	23.0	21 17 42 3	+ 0 29 11.4	23.0	73 47 53 2	3 55 03 0
23 5	338 16 21.8	+ 3 54 49.0	23 5	28 06 09.4	− 0 07 16.7	23.5	80 53 57.3	4 19 04 6
24.0	344 41 24 0	3 32 17.9	24.0	34 57 15 2	0 43 54 4	24.0	88 00 02 3	4 39 06 9
24 5	351 09 23.9	3 06 50.0	24.5	41 51 00.3	1 20 09.0	24.5	95 05 52.5	4 54 52 0
25.0	357 40 31 7	2 38 43.7	25.0	48 47 24.9	1 55 27.4	25.0	102 11 12 3	5 06 06 2
25 5	4 14 50.0	2 08 14.0	25.5	55 46 28 4	2 29 16.1	25.5	109 15 45.1	5 12 39 0
26 0	10 52 58 8	+ 1 35 42 6	26.0	62 48 08 4	− 3 01 02.2	26.0	116 19 13.7	5 14 29.1
26 5	17 34 44 3	1 01 32.3	26.5	69 52 19 4	3 30 13.4	26.5	123 21 20 0	5 11 34 3
27.0	24 20 29.6	+ 0 26 08.8	27.0	76 58 52 0	3 56 19.5	27 0	130 21 45.1	5 04 01 0
27.5	31 10 27.0	0 09 50 7	27.5	84 07 32.9	4 18 52.3	27.5	137 20 09 2	4 51 59 5
28.0	38 04 47.1	0 46 22.7	28.0	91 18 03 0	4 37 26.0	28.0	144 16 12.4	4 35 44 7
28 5	45 03 37 2	1 22 27.4	28.5	98 29 57 8	4 51 41 0	28.5	151 09 34 8	−4 15 35 4
29.0	52 06 59 4	1 57 39.1	29.0	105 42 47 3	5 01 21.2	29 0	157 59 57 6	3 51 51 1
29.5	59 14 50 1	2 31 22.1	29.5	112 55 56.5	5 06 13 7	29 5	164 47 02 5	3 25 06 4
30 0	66 26 58.1	3 02 59 8	30 0	120 08 45 7	5 06 14 2	30 0	171 30 33.3	2 55 40 0
30 5	73 43 03 3	3 31 55.7	30.5	127 20 32 5	5 01 23.0	30.5	178 10 16 6	2 24 04 5
31.0	81 02 36 8	3 57 35.3	31.0	134 30 32 7	4 51 50 4	31.0	184 46 01 0	1 50 49 5
31.5	88 24 50 9	4 19 26.5	31.5	141 38 02 3	4 37 47.1	31 5	191 17 41 6	1 16 26 0

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER. True Longitude.	OCTOBER. Latitude.	Day of Month.	NOVEMBER. True Longitude.	NOVEMBER. Latitude.	Day of Month.	DECEMBER. True Longitude.	DECEMBER. Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	184 56 01.9	− 1 50 49.5	1.0	231 11 29.3	+ 2 18 18.4	1.0	263 47 37.1	+ 4 24 53.2
1.5	191 17 41.6	1 16 26.9	1.5	237 15 53.3	2 47 38.8	1.5	269 43 45.5	4 39 39.1
2.0	197 45 12.2	0 41 25.0	2.0	243 18 05.1	3 14 54.7	2.0	275 39 24.6	4 51 21.8
2.5	204 03 33.9	− 0 06 12.6	2.5	249 18 18.9	3 39 51.0	2.5	281 34 48.5	4 59 55.1
3.0	210 27 50.9	+ 0 28 43.2	3.0	255 16 50.6	4 02 14.8	3.0	287 30 13.2	5 05 14.4
3.5	216 43 11.5	+ 1 02 57.3	3.5	261 13 59.2	+ 4 21 54.9	3.5	293 25 56.6	+ 5 07 16.6
4.0	222 54 48.2	1 36 07.1	4.0	267 10 05.4	4 38 41.6	4.0	299 22 19.0	5 06 00.0
4.5	229 02 56.9	2 07 51.9	4.5	273 05 32.3	4 52 27.1	4.5	305 19 43.3	5 01 24.1
5.0	235 07 57.1	2 37 53.5	5.0	279 00 45.3	5 03 04.5	5.0	311 18 34.7	4 53 29.7
5.5	241 10 11.5	3 05 55.4	5.5	284 56 12.1	5 10 28.1	5.5	317 19 20.8	4 42 18.4
6.0	247 10 05.7	+ 3 31 43.5	6.0	290 52 22.2	+ 5 14 33.5	6.0	323 22 31.6	+ 4 27 53.3
6.5	253 08 08.1	3 55 05.2	6.5	296 49 47.1	5 15 16.9	6.5	329 28 39.2	4 10 18.8
7.0	259 04 49.0	4 15 49.4	7.0	302 48 59.5	5 12 35.3	7.0	335 38 17.2	3 49 40.4
7.5	265 00 40.9	4 33 46.2	7.5	308 50 33.7	5 06 26.8	7.5	341 52 00.1	3 26 05.4
8.0	270 56 17.6	4 48 46.8	8.0	314 55 04.4	4 56 50.4	8.0	348 10 23.0	2 59 42.9
8.5	276 52 13.9	+ 5 00 43.3	8.5	321 03 06.5	+ 4 43 46.0	8.5	354 34 00.9	+ 2 30 44.3
9.0	282 49 05.4	5 09 28.3	9.0	327 15 14.6	4 27 15.2	9.0	1 03 26.6	1 59 23.9
9.5	288 47 27.7	5 11 55.3	9.5	333 32 02.2	4 07 20.9	9.5	7 39 10.8	1 25 58.6
10.0	294 47 56.1	5 16 53.3	10.0	339 54 00.7	3 44 08.4	10.0	14 21 39.7	0 50 49.5
10.5	300 51 04.7	5 15 31.9	10.5	346 21 38.7	3 17 45.4	10.5	21 11 13.7	+ 0 14 21.4
11.0	306 57 27.2	+ 5 10 31.8	11.0	352 55 20.8	+ 2 48 23.1	11.0	28 08 05.8	− 0 22 56.2
11.5	313 07 34.5	5 01 55.0	11.5	359 35 26.2	2 16 16.3	11.5	35 12 19.3	1 00 29.9
12.0	319 21 54.9	4 49 39.3	12.0	6 22 08.0	1 41 44.2	12.0	42 23 46.5	1 37 41.7
12.5	325 40 53.7	4 33 45.0	12.5	13 15 31.3	1 05 10.8	12.5	49 42 07.2	2 13 50.5
13.0	332 04 51.9	4 14 14.5	13.0	20 15 32.9	+ 0 27 05.0	13.0	57 06 47.2	2 48 12.5
13.5	338 34 05.11	+ 3 51 13.3	13.5	27 21 59.4	− 0 11 59.3	13.5	64 36 58.5	− 3 20 03.4
14.0	345 08 47.4	3 24 50.0	14.0	34 34 27.2	0 51 23.2	14.0	72 11 40.3	3 48 39.8
14.5	351 49 00.8	2 55 18.0	14.5	41 52 22.2	1 30 24.4	14.5	79 49 39.7	4 13 21.9
15.0	358 34 45.1	2 22 54.5	15.0	49 15 00.2	2 08 18.3	15.0	87 29 34.5	4 33 35.1
15.5	5 25 52.2	1 48 01.9	15.5	56 41 27.2	2 44 18.8	15.5	95 09 58.1	4 48 52.5
16.0	12 22 07.2	+ 1 11 07.3	16.0	64 10 41.8	− 3 17 41.6	16.0	102 49 21.7	− 4 58 56.0
16.5	19 23 08.6	+ 0 32 42.7	16.5	71 41 37.2	3 47 44.9	16.5	110 26 19.5	5 03 37.1
17.0	26 28 28.5	− 0 05 36.0	17.0	79 13 03.3	4 13 52.0	17.0	117 59 32.5	5 02 56.9
17.5	33 37 33.3	0 46 09.3	17.5	86 43 49.9	4 35 32.8	17.5	125 27 51.8	4 57 05.2
18.0	40 49 44.0	1 25 15.6	18.0	94 12 49.8	4 52 24.7	18.0	132 50 21.2	4 46 19.6
18.5	48 04 21.8	− 2 03 12.4	18.5	101 39 01.4	− 5 04 13.3	18.5	140 06 18.4	− 4 31 03.9
19.0	55 20 39.9	2 39 17.7	19.0	109 01 30.8	5 10 52.8	19.0	147 15 15.2	4 11 46.0
19.5	62 37 54.8	3 12 51.8	19.5	116 19 33.1	5 12 24.6	19.5	154 16 57.0	3 48 56.4
20.0	69 55 22.2	3 43 18.1	20.0	123 32 33.3	5 08 57.1	20.0	161 11 21.9	3 23 07.0
20.5	77 12 19.9	4 10 04.8	20.5	130 40 07.3	5 00 44.6	20.5	167 58 38.4	2 54 49.6
21.0	84 28 08.8	− 4 32 45.4	21.0	137 42 00.6	− 4 48 05.7	21.0	174 39 03.7	− 2 24 35.3
21.5	91 42 14.1	4 50 59.4	21.5	144 38 07.8	4 31 22.5	21.5	181 13 01.9	1 52 54.0
22.0	98 54 05.2	5 04 32.5	22.0	151 28 31.9	4 10 59.5	22.0	187 41 01.9	1 20 13.5
22.5	106 03 16.4	5 13 16.3	22.5	158 13 21.3	3 47 22.6	22.5	194 03 35.6	0 47 00.0
23.0	113 09 27.2	5 17 08.3	23.0	164 52 50.8	3 20 58.5	23.0	200 21 16.9	− 0 13 37.9
23.5	120 12 21.9	− 5 16 11.5	23.5	171 27 18.4	− 2 52 14.0	23.5	206 34 40.3	+ 0 19 30.0
24.0	127 11 49.2	5 10 33.5	24.0	177 57 04.8	2 21 36.1	24.0	212 44 19.9	0 52 02.5
24.5	134 07 41.5	5 00 26.1	24.5	184 22 31.9	1 49 31.1	24.5	218 50 48.1	1 23 40.1
25.0	140 59 51.9	4 46 05.0	25.0	190 44 02.4	1 16 24.7	25.0	224 54 35.8	1 54 04.4
25.5	147 48 23.2	4 27 48.7	25.5	197 01 58.5	0 42 42.0	25.5	230 56 11.3	2 22 58.2
26.0	154 33 22.1	− 4 05 58.6	26.0	203 16 41.5	− 0 08 47.3	26.0	236 56 00.7	+ 2 50 05.4
26.5	161 14 38.9	3 40 57.9	26.5	209 28 31.4	+ 0 24 56.1	26.5	242 54 26.0	3 15 11.1
27.0	167 52 22.3	3 13 11.8	27.0	215 37 46.7	0 58 05.5	27.0	248 51 50.0	3 38 01.4
27.5	174 25 36.0	2 43 06.4	27.5	221 44 44.1	1 30 19.9	27.5	254 48 27.9	3 58 23.9
28.0	180 57 24.8	2 11 08.8	28.0	227 49 38.7	2 01 19.0	28.0	260 44 35.7	4 16 06.8
28.5	187 24 53.6	− 1 37 46.5	28.5	233 52 44.1	+ 2 30 43.6	28.5	266 40 26.6	+ 4 31 00.6
29.0	193 49 05.9	1 03 26.9	29.0	239 54 12.5	2 58 16.4	29.0	272 36 12.1	4 42 56.0
29.5	200 10 10.2	− 0 28 37.3	29.5	245 54 15.3	3 23 41.4	29.5	278 32 02.0	4 51 46.5
30.0	206 28 08.8	+ 0 06 15.9	30.0	251 53 03.2	3 46 44.2	30.0	284 28 06.0	4 57 26.5
30.5	212 43 08.7	0 40 47.3	30.5	257 50 46.8	4 07 11.8	30.5	290 24 33.0	4 59 52.0
31.0	218 55 16.8	+ 1 14 32.9	31.0	263 47 37.1	+ 4 24 53.2	31.0	296 21 32.5	+ 4 59 01.0
31.5	225 04 40.5	+ 1 47 10.2	31.5	269 43 45.5	+ 4 39 39.1	31.5	302 19 14.7	+ 4 54 53.1

GREENWICH MEAN NOON.

Date.	*i* Inclination to the Earth's Equator.	Δ Ascending Node on Earth's Equator to Ascending Node on Ecliptic.	Ω' Ascending Node on Earth's Equator.	Γ' Longitude of the Moon's Perigee. Daily Motion. + 6.684'.	Ω Mean Longitude of Moon's Ascending Node Daily Motion. − 3.177'.	☾ Moon's Mean Longitude.
	° ′	° ′	° ′	° ′	° ′	° ′
Jan. 0	24 35.5	38 24.6	2 18.7	55 39.1	220 31.5	169 12.9
10	24 36.0	37 54.3	2 17.1	56 46.0	219 59.7	300 58.8
20	24 36.5	37 24.0	2 15.5	57 52.8	219 27.9	72 44.6
30	24 37.0	36 53.7	2 14.0	58 59.7	218 56.1	204 30.4
Feb. 9	24 37.5	36 33.4	2 12.4	60 06.5	218 24.4	336 16.3
19	24 38.0	35 53.0	2 10.8	61 13.3	217 52.6	108 02.1
Mar. 1	24 38.4	35 22.7	2 09.2	62 20.2	217 20.8	239 47.9
11	24 38.9	34 52.4	2 07.6	63 27.0	216 49.0	11 33.8
21	24 39.4	34 22.1	2 06.0	64 33.9	216 17.3	143 19.6
31	24 39.9	33 51.8	2 04.4	65 40.7	215 45.5	275 05.5
Apr. 10	24 40.3	33 21.5	2 02.7	66 47.6	215 13.7	46 51.3
20	24 40.7	32 51.3	2 01.1	67 54.4	214 42.0	178 37.1
30	24 41.1	32 21.0	1 59.4	69 01.2	214 10.2	310 23.0
May 10	24 41.5	31 50.8	1 57.8	70 08.1	213 38.4	82 08.8
20	24 41.9	31 20.6	1 56.1	71 14.9	213 06.6	213 54.6
30	24 42.4	30 50.3	1 54.4	72 21.8	212 34.9	345 40.5
June 9	24 42.8	30 20.1	1 52.7	73 28.6	212 03.1	117 26.3
19	24 43.2	29 49.9	1 51.0	74 35.4	211 31.3	249 12.1
29	24 43.6	29 19.7	1 49.3	75 42.3	210 59.6	20 58.0
July 9	24 44.0	28 49.5	1 47.6	76 49.1	210 27.8	152 43.8
19	24 44.5	28 19.2	1 45.9	77 56.0	209 56.0	284 29.7
29	24 44.8	27 49.0	1 44.2	79 02.8	209 24.2	56 15.5
Aug. 8	24 45.2	27 18.9	1 42.4	80 09.7	208 52.5	188 01.3
18	24 45.5	26 48.7	1 40.7	81 16.5	208 20.7	319 47.2
28	24 45.9	26 18.6	1 38.9	82 23.4	207 48.9	91 33.0
Sept. 7	24 46.3	25 48.4	1 37.1	83 30.2	207 17.1	223 18.8
17	24 46.6	25 18.2	1 35.3	84 37.0	206 45.4	355 04.7
27	24 47.0	24 48.1	1 33.5	85 43.9	206 13.6	126 50.5
Oct. 7	24 47.3	24 17.9	1 31.8	86 50.7	205 41.8	258 36.3
17	24 47.6	23 47.7	1 30.0	87 57.6	205 10.1	30 22.2
27	24 48.0	23 17.5	1 28.2	89 04.4	204 38.3	162 08.0
Nov. 6	24 48.3	22 47.4	1 26.4	90 11.2	204 06.5	293 53.9
16	24 48.6	22 17.3	1 24.6	91 18.1	203 34.7	65 39.7
26	24 48.9	21 47.2	1 22.8	92 24.9	203 03.0	197 25.5
Dec. 6	24 49.2	21 17.1	1 21.0	93 31.8	202 31.2	329 11.4
16	24 49.5	20 47.0	1 19.2	94 38.6	201 59.4	100 57.2
26	24 49.8	20 16.9	1 17.4	95 45.5	201 27.6	232 43.0
36	24 50.2	19 46.8	1 15.6	96 52.3	200 55.9	4 28.9

Mean Solar Days.	Motion of Moon in Mean Longitude.
	° ′
0.1	1 19.06
0.2	2 38.12
0.3	3 57.18
0.4	5 16.23
0.5	6 35.29
0.6	7 54.35
0.7	9 13.41
0.8	10 32.47
0.9	11 51.53
1.0	13 10.58
2.0	26 21.17
3.0	39 31.75
4.0	52 42.33
5.0	65 52.92
6.0	79 03.50
7.0	92 14.09
8.0	105 24.67
9.0	118 35.25
10.0	131 45.84
Hours.	° ′
1	0 32.94
2	1 05.88
3	1 38.82
4	2 11.76
5	2 44.70
6	3 17.65
7	3 50.59
8	4 23.53
9	4 56.47
10	5 29.41
11	6 02.35
12	6 35.29
13	7 08.23
14	7 41.17
15	8 14.11
16	8 47.06
17	9 20.00
18	9 52.94
19	10 25.88
20	10 58.82
21	11 31.76
22	12 04.70
23	12 37.64

QUANTITIES REQUIRED IN COMPUTING THE MOON'S LIBRATION.

ARGUMENT, $(\Omega-\lambda)$, or $(\Omega-\lambda-180°)$.

SUN'S ABERRATION AND HORIZONTAL PARALLAX.

FOR GREENWICH MEAN NOON.

$\Omega-\lambda$	μ	$\dfrac{1}{A}$	B	$\Omega-\lambda$	Date.		Aberration. (*Struve.*)	Hor. Par.
°	′		° ′	°	1902.		″	″
0	0.0	39	0 00.0	180	Jan.	0	− 20.79	8.95
2	0.0	39	0 03.1	178		10	20.78	8.95
4	0.1	39	0 06.2	176		20	20.77	8.94
6	0.2	39	0 09.3	174		30	20.75	8.93
8	0.2	39	0 12.4	172	Feb.	9	20.71	8.92
10	0.2	39	0 15.4	170		19	− 20.67	8.90
12	0.3	40	0 18.5	168	March	1	20.62	8.88
14	0.3	40	0 21.5	166		11	20.56	8.86
16	0.3	40	0 24.5	164		21	20.50	8.83
18	0.3	41	0 27.4	162		31	20.44	8.81
20	0.4	41	0 30.4	160	April	10	− 20.38	8.78
22	0.4	42	0 33.2	158		20	20.33	8.76
24	0.4	42	0 36.1	156		30	20.28	8.73
26	0.5	43	0 38.9	154	May	10	20.24	8.71
28	0.5	44	0 41.7	152		20	20.19	8.69
30	0.5	45	0 44.4	150		30	− 20.16	8.68
32	0.5	46	0 47.0	148	June	9	20.13	8.67
34	0.5	47	0 49.7	146		19	20.11	8.66
36	0.5	48	0 52.2	144		29	20.10	8.65
38	0.6	49	0 54.7	142	July	9	20.10	8.66
40	0.6	50	0 57.1	140		19	− 20.11	8.66
42	0.6	52	0 59.4	138		29	20.13	8.67
44	0.6	54	1 01.7	136	Aug.	8	20.16	8.68
46	0.6	56	1 03.9	134		18	20.20	8 69
48	0.6	58	1 06.0	132		28	20.24	8.71
50	0.6	60	1 08.0	130	Sept.	7	− 20.29	8.73
52	0.6	63	1 10.0	128		17	20.35	8.76
54	0.5	66	1 11.8	126		27	20.41	8.78
56	0.5	69	1 13.6	124	Oct.	7	20.47	8.81
58	0.5	73	1 15.3	122		17	20.53	8.83
60	0.5	77	1 16.9	120		27	− 20.58	8.86
62	0.5	83	1 18.4	118	Nov.	6	20.63	8.88
64	0.5	89	1 19.8	116		16	20.68	8 90
66	0.4	95	1 21.1	114		26	20.72	8.92
68	0 4	103	1 22.3	112	Dec.	6	20.75	8.93
70	0.4	113	1 23.4	110		16	− 20.77	8.94
72	0.4	125	1 24.4	108		26	20.79	8.95
74	0.3	141	1 25.3	106		36	− 20.79	8.95
76	0.3	160	1 26.1	104				
78	0.2	186	1 26.8	102				
80	0.2	222	1 27.4	100				
82	0.2	278	1 27.9	98				
84	0.1	370	1 28.3	96				
86	0.1	554	1 28.6	94				
88	0.0	1110	1 28.7	92				
90	0 0	∞	1 28.8	90				

μ has the sign of tan $(\lambda-\Omega)$
A has the sign of cos $(\Omega-\lambda)$
B has the sign of sin $(\Omega-\lambda)$
See formulæ, page 439.

Sun's Mean Equatorial Horizontal Parallax.

8.80″; log = 0.94448.

(CONSTANTS OF STRUVE AND PETERS.)

FOR GREENWICH MEAN NOON.

Date.	Precession in Longitude from 1902.0	Nutation.			Obliquity of Ecliptic. (*Peters.*)	Date.	Precession in Longitude from 1902.0	Nutation.			Obliquity of Ecliptic. (*Peters.*)
		In Longitude.	In R.A.	In Obliquity.				In Longitude.	In R.A.	In Obliquity.	
	"	"	s	"	23° 26′ "		"	"	s	"	23° 26′ "
Jan. 0	− 0.11	+ 11.82	+ 0.722	− 7.56	59.27	July 4	+ 25.35	+ 9.49	+ 0.580	− 8.47	58.13
5	+ 0.58	11.99	0.732	7.55	59.27	9	26.04	9.59	0.587	8.45	58.14
10	1.27	12.12	0.741	7.52	59.29	14	26.73	9.68	0.592	8.42	58.17
15	1.95	12.23	0.748	7.48	59.33	19	27.41	9.74	0.596	8.37	58.20
20	2.64	12.31	0.753	7.43	59.38	24	28.10	9.78	0 598	8.32	58.25
25	+ 3.33	+ 12.36	+ 0.756	− 7.37	59.43	29	+ 28.79	+ 9.78	+ 0.598	− 8.26	58.31
30	4.02	12.37	0.757	7.30	59.49	Aug. 3	29.48	9.75	0.596	8.19	58.37
Feb. 4	4.71	12.34	0.755	7.23	59.56	8	30.17	9.69	0.592	8.12	58.43
9	5.39	12.27	0.750	7.16	59.62	13	30.85	9.59	0.586	8.05	58.49
14	6.08	12.16	0.744	7.09	59.68	18	31.54	9.46	0.578	7.98	58.55
19	+ 6.77	+ 12.01	+ 0.735	− 7.03	59.73	23	+ 32.23	+ 9.29	+ 0.568	− 7.92	58.61
24	7.46	11.83	0.723	6.98	59.78	28	32.92	9.09	0.556	7.86	58.66
Mar. 1	8.15	11.61	0.710	6.94	59.82	Sept. 2	33.61	8.87	0.542	7.82	58.70
6	8.84	11.37	0.696	6.91	59.84	7	34.29	8.62	0.527	7.78	58.73
11	9.52	11.11	0.680	6.89	59.85	12	34.98	8.35	0.511	7.76	58.75
16	+ 10.21	+ 10.84	+ 0.663	− 6.89	59.84	17	+ 35.67	+ 8.07	+ 0.494	− 7.75	58.75
21	10.90	10.56	0.646	6.91	59.82	22	36.36	7.78	0.476	7.76	58.73
26	11.59	10.28	0.628	6.94	59.78	27	37.05	7.49	0.458	7.78	58.70
31	12.28	10.00	0.612	6.99	59.72	Oct. 2	37.73	7.20	0.441	7.82	58.66
Apr. 5	12.96	9.74	0.596	7.06	59.65	7	38.42	6.93	0.424	7.88	58.6)
10	+ 13.65	+ 9.49	+ 0.580	− 7.13	59.57	12	+ 39.11	+ 6.67	+ 0.408	− 7.95	58.52
15	14.34	9.27	0.567	7.22	59 47	17	39.80	6.44	0.394	8.03	58.43
20	15.03	9.07	0.555	7.32	59.36	22	40.49	6.23	0.381	8.12	58.33
25	15.72	8.90	0.544	7.43	59.25	27	41.17	6.06	0.370	8.23	58.22
30	16.40	8.77	0.536	7.55	59 13	Nov. 1	41.86	5.92	0.362	8.34	58.11
May 5	+ 17.09	+ 8.67	+ 0.530	− 7.66	59.01	6	+ 42.55	+ 5.81	+ 0.356	− 8.45	57.99
10	17.78	8.60	0.526	7.78	58.89	11	43.24	5.75	0.352	8.57	57.86
15	18.47	8.57	0.524	7.89	58.77	16	43.93	5 73	0.351	8.68	57.74
20	19.16	8.58	0.525	8.00	58.65	21	44.62	5.75	0.352	8.79	57.63
25	19.84	8.61	0.527	8.11	58.54	26	45 30	5.80	0.355	8.89	57.53
30	+ 20.53	+ 8.68	+ 0.531	− 8.20	58.44	Dec. 1	+ 45.99	+ 5.89	+ 0.360	− 8.98	57.43
June 4	21.22	8.76	0.536	8.28	58 35	6	46.68	6.00	0.367	9.05	57 34
9	21.91	8.86	0.542	8.35	58.28	11	47.37	6.14	0.375	9.12	57.27
14	22.60	8.98	0.549	8.40	58.22	16	48.06	6.29	0.384	9.16	57.22
19	23.28	9.11	0 557	8.44	58.17	21	48.74	6.45	0.394	9.19	57.19
24	+ 23.97	+ 9.24	+ 0.565	−- 8.47	58.14	26	+ 49.43	+ 6.61	+ 0.404	− 9.21	57.17
29	24.66	9.37	0.573	8.48	58 13	31	50.12	6.77	0 414	9.20	57.17
July 4	+ 25.35	+ 9.49	+ 0.580	− 8.47	58.13	36	+ 50.81	+ 6.91	+ 0.423	− 9.18	57.18

Precession for 1902 (*Struve*). 50.2642 log = 1.70126
Precession in a Solar day 0.1376 log = 9.13867
Precession in a Sidereal day. 0.1372 log = 9 13748

Mean Obliquity, 1902.0.
Peters 23 27 06 83
Hansen 23 27 07.09
Le Verrier 23 27 07 08
Newcomb 23 27 07 32

FOR GREENWICH MEAN NOON.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	"	"		"	"		"	"		"	"
Jan. 0	+ 0.07	+ 0.08	Feb. 15	− 0.17	− 0.04	Apr. 2	+ 0.08	− 0.04	May 18	− 0.02	+ 0.06
1	− 0.01	0.07	16	− 0.09	0.07	3	0.10	− 0.01	19	0.08	0.04
2	0.08	0.04	17	+ 0.01	0.08	4	0.11	+ 0.02	20	0.11	+ 0.02
3	0.12	+ 0.01	18	0.11	0.07	5	+ 0.07	0.05	21	0.13	− 0.02
4	0.14	− 0.01	19	0.19	0.04	6	− 0.01	0.07	22	0.12	0.04
5	0.12	0.04	20	0.24	− 0.01	7	0.08	0.07	23	0.08	0.05
6	0.09	0.06	21	0.23	+ 0.02	8	0.16	0.06	24	− 0.04	0.06
7	− 0.05	0.07	22	0.19	0.05	9	0.19	+ 0.02	25	+ 0.01	0.06
8	0.00	0.06	23	0.11	0.08	10	0.19	− 0.01	26	0.06	0.05
9	+ 0.05	0.05	24	+ 0.03	0.08	11	0.15	0.04	27	0.09	0.04
10	+ 0.10	− 0.03	25	− 0.05	+ 0.06	12	− 0.06	− 0.07	28	+ 0.10	− 0.01
11	0.12	− 0.01	26	0.11	+ 0.03	13	+ 0.04	0.08	29	0.09	+ 0.03
12	0.11	+ 0.02	27	0.14	0.00	14	0.15	0.06	30	+ 0.03	0.05
13	+ 0.07	0.05	28	0.15	− 0.02	15	0.22	0.03	31	− 0.05	0.07
14	− 0.01	0.08	Mar. 1	0.13	0.04	16	0.26	− 0.01	June 1	0.13	0.07
15	0.09	0.07	2	0.10	0.06	17	0.24	+ 0.02	2	0.20	0.05
16	0.17	0.05	3	− 0.05	0.07	18	0.17	0.06	3	0.24	+ 0.02
17	0.21	+ 0.02	4	+ 0.01	0.07	19	0.09	0.08	4	0.22	− 0.02
18	0.20	− 0.01	5	0.07	0.05	20	+ 0.02	0.08	5	0.16	0.06
19	0.16	0.04	6	0.11	− 0.02	21	− 0.06	0.06	6	− 0.06	0.08
20	− 0.08	− 0.08	7	+ 0.12	+ 0.01	22	− 0.12	+ 0.03	7	+ 0.05	− 0.07
21	+ 0.03	0.08	8	0.11	0.04	23	0.15	0.00	8	0.15	0.06
22	0.13	0.06	9	+ 0.05	0.06	24	0.16	− 0.03	9	0.23	− 0.03
23	0.21	− 0.03	10	− 0.02	0.08	25	0.13	0.05	10	0.25	0.00
24	0.23	0.00	11	0.10	0.07	26	0.09	0.06	11	0.24	+ 0.03
25	0.22	+ 0.03	12	0.17	0.05	27	− 0.03	0.06	12	0.17	0.06
26	0.18	0.06	13	0.20	+ 0.02	28	+ 0.02	0.06	13	0.09	0.07
27	0.10	0.07	14	0.20	− 0.02	29	0.07	0.04	14	+ 0.01	0.07
28	+ 0.02	0.07	15	0.14	0.06	30	0.11	− 0.01	15	− 0.05	0.05
29	0.06	0.05	16	− 0.03	0.07	May 1	0.11	+ 0.02	16	0.09	+ 0.02
30	− 0.11	+ 0.02	17	+ 0.08	− 0.08	2	+ 0.08	+ 0.05	17	− 0.11	0.00
31	0.15	0.00	18	0.17	0.06	3	+ 0.01	0.07	18	0.12	− 0.03
Feb. 1	0.15	− 0.03	19	0.22	− 0.02	4	− 0.07	0.07	19	0.08	0.05
2	0.12	0.05	20	0.24	+ 0.01	5	0.13	0.07	20	− 0.03	0.07
3	0.07	0.06	21	0.21	0.05	6	0.20	+ 0.04	21	+ 0.02	0.06
4	− 0.02	0.07	22	0.14	0.08	7	0.20	0.00	22	0.06	0.05
5	+ 0.05	0.06	23	+ 0.06	0.08	8	0.19	− 0.04	23	0.09	− 0.02
6	0.09	0.04	24	− 0.02	0.07	9	0.12	0.07	24	0.09	0.00
7	0.12	− 0.02	25	0.09	0.05	10	− 0.01	0.08	25	0.08	+ 0.03
8	0.12	+ 0.01	26	0.14	+ 0.01	11	+ 0.10	0.07	26	+ 0.04	0.05
9	+ 0.09	+ 0.04	27	− 0.16	− 0.01	12	+ 0.19	− 0.05	27	− 0.02	+ 0.08
10	+ 0.03	0.07	28	0.15	0.03	13	0.24	− 0.02	28	0.11	0.07
11	− 0.05	0.07	29	0.11	0.05	14	0.25	+ 0.02	29	0.18	0.05
12	0.13	0.06	30	0.06	0.06	15	0.22	0.05	30	0.23	+ 0.02
13	0.19	+ 0.03	31	− 0.01	0.06	16	0.15	0.07	July 1	0.24	− 0.01
14	0.20	0.00	Apr. 1	+ 0.05	0.06	17	+ 0.07	0.07	2	0.19	0.04
15	− 0.17	− 0.04	2	+ 0.08	− 0.04	18	− 0.02	+ 0.06	3	− 0.09	− 0.07

FOR GREENWICH MEAN NOON.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	"	"		"	"		"	"		"	"
July 3	− 0.09	− 0.07	Aug. 18	+ 0.13	+ 0.01	Oct. 3	− 0.12	+ 0.02	Nov. 18	+ 0.03	− 0.07
4	+ 0.01	0.08	19	0.10	0.04	4	0.14	0.00	19	0.14	0.06
5	0.12	0.06	20	+ 0.03	0.06	5	0.13	− 0.03	20	0.21	− 0.03
6	0.19	− 0.03	21	− 0.03	0.07	6	0.09	0.06	21	0.24	+ 0.01
7	0.23	0.00	22	0.10	0.07	7	− 0.05	0.07	22	0.22	0.04
8	0.23	+ 0.04	23	0.18	0.05	8	0.00	0.07	23	0.16	0.06
9	0.19	0.07	24	0.20	+ 0.03	9	+ 0.06	0.06	24	+ 0.09	0.08
10	0.10	0.07	25	0.21	0.00	10	0.09	− 0.03	25	0.00	0.07
11	+ 0.01	0.07	26	0.16	− 0.04	11	0.11	0.00	26	− 0.06	0.04
12	− 0.05	0.05	27	− 0.07	0.07	12	0.11	+ 0.03	27	0.10	+ 0.02
13	− 0.09	+ 0.02	28	+ 0.03	− 0.07	13	+ 0.07	+ 0.05	28	− 0.12	− 0.01
14	0.12	− 0.01	29	0.12	0.05	14	+ 0.02	0.07	29	0.10	0.04
15	0.10	0.04	30	0.19	− 0.02	15	− 0.05	0.07	30	0.06	0.06
16	0.07	0.06	31	0.21	+ 0.01	16	0.14	0.06	Dec. 1	− 0.02	0.07
17	− 0.02	0.06	Sept. 1	0.20	0.04	17	0.19	+ 0.04	2	+ 0.04	0.06
18	+ 0.02	0.06	2	0.15	0.07	18	0.21	0.00	3	0.07	0.04
19	0.07	0.06	3	+ 0.05	0.08	19	0.19	− 0.03	4	0.10	− 0.02
20	0.11	0.03	4	− 0.02	0.07	20	0.12	0.06	5	0.10	+ 0.01
21	0.12	− 0.01	5	0.09	0.04	21	− 0.02	0.08	6	0.09	0.03
22	0.11	+ 0.01	6	0.13	+ 0.01	22	+ 0.09	0.06	7	+ 0.03	0.05
23	+ 0.07	+ 0.04	7	− 0.12	− 0.01	23	+ 0.18	− 0.04	8	− 0.03	+ 0.06
24	+ 0.01	0.07	8	0.11	0.03	24	0.23	− 0.01	9	0.11	0.07
25	− 0.07	0.07	9	0.06	0.05	25	0.24	+ 0.03	10	0.18	0.06
26	0.15	0.06	10	− 0.01	0.06	26	0.20	0.06	11	0.23	+ 0.04
27	0.20	+ 0.03	11	+ 0.04	0.07	27	0.13	0.07	12	0.24	0.00
28	0.23	0.00	12	0.09	0.05	28	+ 0.03	0.08	13	0.20	− 0.04
29	0.22	− 0.03	13	0.11	− 0.03	29	− 0.04	0.06	14	0.11	0.06
30	0.14	0.06	14	0.13	0.00	30	0.10	+ 0.03	15	− 0.01	0.07
31	− 0.04	0.08	15	0.11	+ 0.03	31	0.13	0.00	16	+ 0.10	0.07
Aug. 1	+ 0.07	0.07	16	+ 0.06	0.05	Nov. 1	0.13	− 0.03	17	0.19	0.04
2	+ 0.16	− 0.05	17	0.00	+ 0.07	2	− 0.10	− 0.05	18	+ 0.23	− 0.01
3	0.21	− 0.02	18	− 0.08	0.07	3	0.06	0.06	19	0.23	+ 0.02
4	0.22	+ 0.02	19	0.15	0.05	4	− 0.01	0.06	20	0.19	0.06
5	0.20	0.06	20	0.21	+ 0.02	5	+ 0.03	0.06	21	0.11	0.08
6	0.12	0.07	21	0.21	− 0.01	6	0.09	0.04	22	+ 0.03	0.07
7	+ 0.04	0.08	22	0.18	0.04	7	0.10	− 0.02	23	− 0.04	0.05
8	− 0.05	0.06	23	− 0.10	0.06	8	0.11	+ 0.01	24	0.09	+ 0.02
9	0.09	+ 0.03	24	0.00	0.07	9	0.07	0.04	25	0.11	− 0.01
10	0.12	0.00	25	+ 0.09	0.07	10	+ 0.02	0.06	26	0.10	0.03
11	0.13	− 0.03	26	0.18	0.05	11	− 0.04	0.07	27	0.06	0.05
12	− 0.09	− 0.05	27	+ 0.22	· 0.01	12	− 0.12	+ 0.07	28	− 0.01	− 0.07
13	− 0.04	0.06	28	0.20	+ 0.03	13	0.18	0.05	29	+ 0.03	0.06
14	0.00	0.07	29	0.16	0.06	14	0.22	+ 0.02	30	0.08	0.05
15	+ 0.06	0.06	30	+ 0.08	0.07	15	0.21	− 0.02	31	0.10	0.03
16	0.10	0.05	Oct. 1	− 0.01	0.07	16	0.16	0.05	32	0.12	− 0.01
17	0.13	− 0.02	2	0.07	0.05	17	− 0.06	0.08	33	0.11	+ 0.02
18	+ 0.13	+ 0.01	3	− 0.12	+ 0.02	18	+ 0.03	− 0.07	34	+ 0.06	+ 0.05

PART II

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON.

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF STRUVE AND PETERS.

NOTATION.

τ, the time, reckoned in units of one year, from the beginning of the Besselian fictitious year, (1901, December 31.584^d = 1902, January 0.584^d, Washington mean time),

a_0, δ_0, the star's mean right ascension and declination at the beginning of the fictitious year,

a, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the sun's true longitude,

Ω, the longitude of the moon's ascending node,

ω, the obliquity of the ecliptic,

Γ, the longitude of the sun's perigee,

Γ', the longitude of the moon's perigee,

$\mathbb{C}$, the moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$A = \tau - 0.34253 \sin \Omega$
$\quad + 0.00410 \sin 2\,\Omega$
$\quad - 0.02519 \sin 2\,\odot$
$\quad + 0.00293 \sin (\odot + 81° \; 56')$
$\quad - 0.00405 \sin 2\,\mathbb{C}$
$\quad + 0.00135 \sin (\mathbb{C} - \Gamma')$
$\qquad$ "

$A' = \tau - 0.34253 \sin \Omega$
$\quad + 0.00410 \sin 2\,\Omega$
$\quad - 0\,02519 \sin 2\,\odot$
$\quad + 0.00293 \sin (\odot + 81° \; 56')$

$B = \quad - 9.2240 \cos \Omega$
$\quad + 0.0895 \cos 2\,\Omega$
$\quad - 0.5506 \cos 2\,\odot$
$\quad - 0.0092 \cos (\odot + 281° \; 15')$
$\quad - 0.0885 \cos 2\,\mathbb{C}$
$\qquad$ "

$B' = \quad - 9.2240 \cos \Omega$
$\quad + 0.0895 \cos 2\,\Omega$
$\quad - 0.5506 \cos 2\,\odot$
$\quad - 0.0092 \cos (\odot + 281° \; 15')$

$C = \quad - 20.4451 \cos \omega \cos \odot$
$D = \quad - 20.4451 \sin \odot$
$E = \quad - \;\; 0.0448 \sin \Omega + 0.0014'' \sin 2\,\Omega - 0.0032'' \sin 2\,\odot$

BESSEL's Star-Constants.

$a = 3.07276^s + 1.33680^s \sin a_0 \tan \delta_0 =$ precession in right ascension
$b = \frac{1}{15} \cos a_0 \tan \delta_0$
$c = \frac{1}{15} \cos a_0 \sec \delta_0$
$d = \frac{1}{15} \sin a_0 \sec \delta_0$

$\quad a' = 20.0519'' \cos a_0 =$ precession in declination
$\quad b' = - \sin a_0$
$\quad c' = \tan \omega \cos \delta_0 - \sin a_0 \sin \delta_0$
$\quad d' = \cos a_0 \sin \delta_0$

Reduction to Apparent Position.

$a = a_0 + \tau \mu + Aa + Bb + Cc + Dd + \frac{1}{15}E$ $\qquad$ (in time)
$\delta = \delta_0 + \tau \mu' + Aa' + Bb' + Cc' + Dd'$ $\qquad$ (in arc)

INDEPENDENT STAR-NUMBERS.

$f = 46.0914'' A + E$ (in arc) $= 3.07276^s A + \frac{1}{15}E$ $\qquad$ (in time)
$f' = 46.0914'' A' + E$ (in arc) $= 3.07276^s A' + \frac{1}{15}E$ $\qquad$ (in time)

$g \sin G = B$	$g' \sin G' = B'$	$h \sin H = C$	
$g \cos G = 20.0519'' A$	$g' \cos G' = 20\,0519''A'$	$h \cos H = D$	$i = C \tan \omega$

Reduction to Apparent Position.

$a = a_0 + f + \tau \mu + \frac{1}{15} g \sin (G + a_0) \tan \delta_0 + \frac{1}{15} h \sin (H + a_0) \sec \delta_0$ (in time)
$\delta = \delta_0 + \tau \mu' + g \cos (G + a_0) + h \cos (H + a_0) \sin \delta_0 + i \cos \delta_0$ (in arc)

NOTES.—(1) The quantities A', B', f', g', and G' are to be used instead of A, B, f, g, and G whenever it is necessary to omit the short period terms, as, for example, in computing the ephemeris of a star at ten-day intervals.

(2) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when BESSEL's star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(3) In using the star-constants of the *British Association Catalogue*, a, b, c, d, a', b', c', a', with the star-numbers of this Ephemeris, the quantities to be formed are Aa, Bd, Ca, Db, $-Ac'$, $-Bd'$, $-Ca'$, $-Db'$.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Jan. 0	+9.37317	+0.8732	−0.50755	+1.30409	Feb. 15	+9.56005	+0.8529	−1.19482	+1.05113
1	9.37575	0.8735	0.54967	1.30269	16	9.56472	0.8536	1.19977	1.03929
2	9.37876	0.8748	0.58796	1.30113	17	9.56970	0.8534	1.20451	1.02700
3	9.38278	0.8767	0.62308	1.29943	18	9.57450	0.8520	1.20938	1.01422
4	9.38819	0.8789	0.65546	1.29758	h 19	9.57867	0.8497	1.21347	1.00089
h (7.0) 5	+9.39496	+0.8807	−0.68538	+1.29559	(10.0) 20	+9.58196	+0.8467	−1.21767	+0.98704
6	9.40273	0.8819	0.71326	1.29345	21	9.58422	0.8435	1.22171	0.97259
7	9.41093	0.8821	0.73937	1.29115	22	9.58539	0.8407	1.22556	0.95750
8	9.41898	0.8812	0.76383	1.28871	23	9.58577	0.8386	1.22926	0.94175
9	9.42632	0.8793	0.78688	1.28613	24	9.58577	0.8378	1.23278	0.92526
10	+9.43252	+0.8767	−0.80862	+1.28338	25	+9.58573	+0.8381	−1.23614	+0.90799
11	9.43738	0.8740	0.82919	1.28048	26	9.58616	0.8394	1.23933	0.88988
12	9.44097	0.8715	0.84870	1.27742	27	9.58734	0.8413	1.24238	0.87086
13	9.44362	0.8697	0.86724	1.27421	28	9.58939	0.8433	1.24528	0.85083
14	9.44593	0.8689	0.88490	1.27083	Mar. 1	9.59225	0.8449	1.24802	0.82971
15	+9.44844	+0.8691	−0.90172	+1.26729	2	+9.59570	+0.8457	−1.25060	+0.80738
16	9.45161	0.8702	0.91777	1.26357	3	9.59943	0.8454	1.25304	0.78368
17	9.45585	0.8719	0.93313	1.25969	4	9.60296	0.8440	1.25533	0.75852
18	9.46133	0.8736	0.94783	1.25564	5	9.60588	0.8418	1.25748	0.73165
19	9.46787	0.8749	0.96191	1.25141	6	9.60806	0.8390	1.25948	0.70285
h (8.0) 20	+9.47507	+0.8754	−0.97541	+1.24701	h (11.0) 7	+9.60938	+0.8363	−1.26134	+0.67197
21	9.48238	0.8748	0.98837	1.24241	8	9.60995	0.8342	1.26306	0.63859
22	9.48926	0.8731	1.00082	1.23764	9	9.61006	0.8329	1.26464	0.60229
23	9.49524	0.8706	1.01278	1.23266	10	9.61002	0.8329	1.26608	0.56258
24	9.49995	0.8676	1.02428	1.22751	11	9.61030	0.8341	1.26738	0.51868
25	+9.50335	+0.8645	−1.03535	+1.22214	12	+9.61122	+0.8361	−1.26856	+0.46978
26	9.50552	0.8618	1.04601	1.21658	13	9.61294	0.8387	1.26959	0.41448
27	9.50688	0.8600	1.05628	1.21081	14	9.61563	0.8411	1.27049	0.35106
28	9.50787	0.8593	1.06619	1.20482	15	9.61902	0.8430	1.27125	0.27657
29	9.50910	0.8596	1.07574	1.19861	16	9.62286	0.8439	1.27189	0.18650
30	+9.51092	+0.8607	−1.08493	+1.19216	17	+9.62669	+0.8438	−1.27240	+0.07276
31	9.51367	0.8623	1.09380	1.18550	18	9.63013	0.8426	1.27276	9.91821
Feb. 1	9.51746	0.8638	1.10237	1.17859	19	9.63290	0.8407	1.27301	9.67558
2	9.52218	0.8647	1.11063	1.17142	20	9.63476	0.8384	1.27311	+9.07809
3	9.52740	0.8646	1.11859	1.16402	21	9.63572	0.8364	1.27310	−9.37035
h (9.0) 4	+9.53264	+0.8635	−1.12629	+1.15633	h (12.0) 22	+9.63593	+0.8351	−1.27294	−9.76959
5	9.53749	0.8614	1.13371	1.14838	23	9.63565	0.8348	1.27267	9.97405
6	9.54160	0.8585	1.14087	1.14014	24	9.63532	0.8358	1.27225	0.11230
7	9.54468	0.8552	1.14776	1.13161	25	9.63528	0.8378	1.27171	0.21677
8	9.54681	0.8521	1.15443	1.12277	26	9.63585	0.8406	1.27104	0.30085
9	+9.54807	+0.8496	−1.16086	+1.11362	27	+9.63720	+0.8437	−1.27024	−0.37105
10	9.54888	0.8481	1.16705	1.10413	28	9.63937	0.8465	1.26930	0.43132
11	9.54974	0.8477	1.17303	1.09429	29	9.64217	0.8487	1.26824	0.48413
12	9.55100	0.8484	1.17879	1.08409	30	9.64529	0.8498	1.26704	0.53101
13	9.55304	0.8498	1.18434	1.07350	31	9.64840	0.8499	1.26571	0.57320
14	+9.55611	+0.8515	−1.18968	+1.06252	Apr. 1	+9.65115	+0.8489	−1.26426	−0.61156
15	+9.56005	+0.8529	−1.19482	+1.05113	2	+9.65329	+0.8474	−1.26267	0.64669

$$E = +0.03'' = +0.002^s$$

(CONSTANTS OF STRUVE AND PETERS.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day (Sid. Hour)	Log A	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
July 1	+ 9.83327	+ 0.9299	+ 0.48502	− 1.30475	Aug. 16	+ 9.91131	+ 0.9050	+ 1.17747	− 1.08648
2	9.83621	0.9315	0.52666	1.30350	17	9.91254	0.9022	1.18280	1.07651
3	9.83945	0.9323	0.56455	1.30212	18	9.91335	0.8993	1.18795	1.06617
4	9.84279	0.9322	0.59928	1.30061	19	9.91376	0.8970	1.19291	1.05545
5	9.84597	0.9311	0.63133	1.29897	20	9.91396	0.8954	1.19770	1.04434
h (19.0) 6	+ 9.84875	+ 0.9293	+ 0.66107	− 1.29723	h (22.0) 21	+ 9.91410	+ 0.8949	+ 1.20232	− 1.03278
7	9.85103	0.9270	0.68879	1.29534	22	9.91441	0.8954	1.20677	1.02079
8	9.85273	0.9248	0.71473	1.29332	23	9.91503	0.8966	1.21106	1.00833
9	9.85392	0.9229	0.73910	1.29118	24	9.91610	0.8981	1.21519	0.99536
10	9.85477	0.9218	0.76205	1.28890	25	9.91759	0.8996	1.21915	0.98187
11	+ 9.85547	+ 0.9216	+ 0.78374	− 1.28650	26	+ 9.91946	+ 0.9005	+ 1.22296	− 0.96780
12	9.85627	0.9223	0.80429	1.28395	27	9.92154	0.9006	1.22661	0.95312
13	9.85738	0.9236	0.82381	1.28127	28	9.92363	0.8997	1.23011	0.93782
14	9.85892	0.9253	0.84236	1.27846	29	9.92551	0.8979	1.23347	0.92180
15	9.86090	0.9268	0.86003	1.27549	30	9.92704	0.8954	1.23667	0.90504
16	+ 9.86330	+ 0.9278	+ 0.87692	− 1.27239	31	+ 9.92812	+ 0.8927	+ 1.23974	− 0.88745
17	9.86593	0.9280	0.89306	1.26916	Sept. 1	9.92873	0.8902	1.24266	0.86903
18	9.86857	0.9272	0.90848	1.26576	2	9.92895	0.8883	1.24544	0.84962
19	9.87101	0.9255	0.92326	1.26222	3	9.92893	0.8874	1.24808	0.82916
20	9.87310	0.9232	0.93745	1.25854	4	9.92887	0.8875	1.25058	0.80755
h (20.0) 21	+ 9.87473	+ 0.9205	+ 0.95108	− 1.25469	h (23.0) 5	+ 9.92896	+ 0.8885	+ 1.25294	− 0.78465
22	9.87588	0.9180	0.96418	1.25069	6	9.92935	0.8903	1.25517	0.76035
23	9.87669	0.9160	0.97678	1.24653	7	9.93014	0.8922	1.25726	0.73446
24	9.87729	0.9149	0.98891	1.24221	8	9.93130	0.8939	1.25923	0.70678
25	9.87790	0.9148	1.00060	1.23772	9	9.93276	0.8949	1.26106	0.67705
26	+ 9.87877	+ 0.9155	+ 1.01187	− 1.23306	10	+ 9.93438	+ 0.8950	+ 1.26275	− 0.64507
27	9.88002	0.9167	1.02273	1.22822	11	9.93595	0.8942	1.26431	0.61025
28	9.88175	0.9182	1.03321	1.22322	12	9.93731	0.8924	1.26576	0.57231
29	9.88394	0.9194	1.04332	1.21802	13	9.93832	0.8902	1.26706	0.53058
30	9.88645	0.9199	1.05310	1.21264	14	9.93893	0.8879	1.26824	0.48430
31	+ 9.88914	+ 0.9195	+ 1.06253	− 1.20707	15	+ 9.93918	+ 0.8859	+ 1.26929	− 0.43215
Aug. 1	9.89173	0.9182	1.07167	1.20130	16	9.93916	0.8847	1.27021	0.37285
2	9.89406	0.9160	1.08049	1.19534	17	9.93906	0.8845	1.27101	0.30395
3	9.89594	0.9133	1.08901	1.18915	18	9.93903	0.8855	1.27168	0.22183
4	9.89730	0.9104	1.09725	1.18277	19	9.93930	0.8872	1.27222	0.12014
h (21.0) 5	+ 9.89819	+ 0.9079	+ 1.10523	− 1.17615	h (0.0) 20	+ 9.93996	+ 0.8895	+ 1.27264	− 9.98691
6	9.89869	0.9060	1.11295	1.16932	21	9.94106	0.8919	1.27292	9.79337
7	9.89899	0.9051	1.12041	1.16225	22	9.94253	0.8939	1.27309	− 9.43505
8	9.89933	0.9051	1.12763	1.15493	23	9.94429	0.8951	1.27313	+ 8.88874
9	9.89986	0.9060	1.13462	1.14736	24	9.94612	0.8953	1.27303	9.63063
10	+ 9.90075	+ 0.9073	+ 1.14136	− 1.13954	25	+ 9.94787	+ 0.8946	+ 1.27281	+ 9.89031
11	9.90206	0.9087	1.14790	1.13144	26	9.94932	0.8931	1.27247	0.05181
12	9.90374	0.9096	1.15423	1.12306	27	9.95036	0.8913	1.27199	0.16912
13	9.90570	0.9099	1.16034	1.11438	28	9.95096	0.8895	1.27138	0.26140
14	9.90775	0.9092	1.16624	1.10540	29	9.95120	0.8882	1.27065	0.33736
15	+ 9.90967	+ 0.9075	+ 1.17196	− 1.09611	30	+ 9.95118	+ 0.8879	+ 1.26979	+ 0.40183
16	+ 9.91131	+ 0.9050	+ 1.17747	− 1.08648	Oct. 1	+ 9.95100	+ 0.8886	+ 1.26880	+ 0.45800

$$E = + 0.03'' = + 0.0c2^{s}$$

(CONSTANTS OF STRUVE AND PETERS.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. Sid. Hour.	Log A	Log B	Log C	Log D	Solar Day. Sid. Hour.	Log A	Log B	Log C	Log D
Oct. 1	+9.95100	+0.8886	+1.26880	+0.45800	Nov. 16	+9.99447	+0.9431	+1.04306	+1.21517
2	9.95101	0.8903	1.26768	0.50764	17	9.99660	0.9447	1.03237	1.2237
3	9.95123	0.8927	1.26642	0.55208	18	9.99875	0.9454	1.02127	1.2258
4	9.95182	0.8956	1.26503	0.59227	19	0.00075	0.9453	1.00973	1.23307
5	9.95280	0.8983	1.26351	0.62899	20	0.00247	0.9446	0.99773	1.23588
h (1.0) 6	+9.95411	+0.9004	+1.26184	+0.66270	h (4.0) 21	+0.00383	+0.9437	+0.98523	+1.24357
7	9.95562	0.9018	1.26005	0.69391	22	0.00481	0.9429	0.97222	1.24507
8	9.95716	0.9021	1.25812	0.72289	23	0.00551	0.9426	0.95869	1.25242
9	9.95856	0.9016	1.25605	0.75000	24	0.00602	0.9432	0.94457	1.25655
10	9.95969	0.9004	1.25384	0.77538	25	0.00653	0.9446	0.92982	1.26057
11	+9.96045	+0.8990	+1.25147	+0.79924	26	+0.00718	+0.9468	+0.91440	+1.26439
12	9.96084	0.8979	1.24897	0.82175	27	0.00809	0.9496	0.89827	1.26804
13	9.96097	0.8974	1.24633	0.84307	28	0.00936	0.9524	0.88139	1.27153
14	9.96096	0.8978	1.24352	0.86327	29	0.01095	0.9550	0.86366	1.27485
15	9.96100	0.8992	1.24057	0.88244	30	0.01278	0.9569	0.84504	1.27802
16	+9.96126	+0.9016	+1.23746	+0.90068	Dec. 1	+0.01475	+0.9579	+0.82542	+1.28104
17	9.96187	0.9045	1.23422	0.91808	2	0.01668	0.9581	0.80473	1.28300
18	9.96292	0.9077	1.23081	0.93469	3	0.01843	0.9575	0.78284	1.28600
19	9.96437	0.9106	1.22722	0.95056	4	0.01990	0.9564	0.75965	1.28910
20	9.96614	0.9128	1.22349	0.96577	5	0.02104	0.9551	0.73502	1.29157
h (2.0) 21	+9.96804	+0.9142	+1.21959	+0.98034	h (5.0) 6	+0.02189	+0.9542	+0.70874	+1.29387
22	9.96993	0.9146	1.21551	0.99435	7	0.02253	0.9539	0.68060	1.29594
23	9.97162	0.9141	1.21126	1.00775	8	0.02311	0.9544	0.65036	1.29788
24	9.97295	0.9132	1.20683	1.02064	9	0.02379	0.9557	0.61773	1.29957
25	9.97388	0.9122	1.20222	1.03305	10	0.02469	0.9577	0.58225	1.30137
26	+9.97444	+0.9115	+1.19743	+1.04499	11	+0.02594	+0.9601	+0.54347	+1.30247
27	9.97471	0.9116	1.19244	1.05649	12	0.02755	0.9625	0.50071	1.30431
28	9.97487	0.9126	1.18727	1.06756	13	0.02948	0.9644	0.45311	1.30557
29	9.97504	0.9146	1.18190	1.07825	14	0.03163	0.9657	0.39953	1.30667
30	9.97544	0.9173	1.17632	1.08854	15	0.03385	0.9660	0.33820	1.30764
31	+9.97616	+0.9206	+1.17053	+1.09849	16	+0.03598	+0.9655	+0.26658	+1.30848
Nov. 1	9.97726	0.9238	1.16453	1.10808	17	0.03786	0.9643	0.18061	1.30911
2	9.97870	0.9266	1.15829	1.11735	18	0.03943	0.9627	0.07313	1.30972
3	9.98039	0.9286	1.15185	1.12628	19	0.04064	0.9611	9.92967	1.31014
4	9.98216	0.9298	1.14515	1.13492	20	0.04153	0.9599	9.71366	1.31044
h (3.0) 5	+9.98384	+0.9300	+1.13822	+1.14325	h (6.0) 21	+0.04222	+0.9594	+9.26458	+1.31057
6	9.98529	0.9295	1.13103	1.15131	22	0.04284	0.9598	−9.17493	1.31058
7	9.98645	0.9287	1.12359	1.15909	23	0.04352	0.9609	9.68404	1.31043
8	9.98726	0.9279	1.11557	1.16660	24	0.04443	0.9626	9.91190	1.31017
9	9.98776	0.9275	1.10758	1.17388	25	0.04560	0.9646	0.06050	1.30977
10	+9.98810	+0.9280	+1.09950	+1.18089	26	+0.04709	+0.9664	0.17007	+1.30923
11	9.98844	0.9293	1.09100	1.18766	27	0.04883	0.9676	0.25881	1.30855
12	9.98895	0.9316	1.08211	1.19421	28	0.05070	0.9681	0.33109	1.30772
13	9.98977	0.9344	1.07287	1.20051	29	0.05258	0.9677	0.39398	1.30673
14	9.99095	0.9376	1.06329	1.20662	30	0.05431	0.9665	0.44838	1.30557
15	+9.99254	+0.9406	+1.05337	+1.21250	31	+0.05581	+0.9646	0.49658	+1.30444
16	+9.99447	+0.9431	+1.04306	+1.21817	32	+0.05704	+0.9625	0.53980	+1.30384

$$E = + 0.02'' = + 0.001^s$$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f In Time.	f' In Time.	G In Arc.	In Time.	H In Arc.	In Time.	Log g.	Log h.	i	Log i.
	y	s	s	° '	h m	° '	h m			"	
Jan. 0	−0.0002	+ 0.729	+ 0.725	57 37.3	3 50.5	350 55.4	23 23.7	+0.94657	+1.30957	− 1.40	− 0.1448
1	+0.0025	0.732	0.735	57 29.3	3 50.0	349 59.1	23 19.9	0.94755	1.30936	1.54	0.1870
2	0.0052	0.737	0.745	57 23.1	3 49.5	349 02.7	23 16.2	0.94931	1.30912	1.68	0.2252
3	0.0080	0.744	0.755	57 15.6	3 49.1	348 06.1	23 12.4	0.95186	1.30887	1.82	0.2604
h 4	0.0107	0.755	0.765	57 03.9	3 48.3	347 09.5	23 08.6	0.95498	1.30859	1.96	0.2928
7.0) 5	0.0135	+ 0.767	+ 0.775	56 46.2	3 47.1	346 12.9	23 04.9	+0.95830	+1.30828	− 2.10	− 0.3227
6	0.0162	0.779	0.786	56 22.0	3 45.5	345 16.2	23 01.1	0.96145	1.30796	2.24	0.3506
7	0.0189	0.794	0.796	55 52.5	3 43.5	344 19.3	22 57.3	0.96411	1.30762	2.38	0.3767
8	0.0217	0.808	0.805	55 19.5	3 41.3	343 22.4	22 53.5	0.96607	1.30726	2.52	0.4011
9	0.0244	0.822	0.815	54 45.2	3 39.0	342 25.4	22 49.7	0.96723	1.30689	2.66	0.4242
10	0.0271	+ 0.833	+ 0.825	54 12.5	3 36.8	341 28.3	22 45.9	+0.96763	+1.30650	− 2.79	− 0.4459
11	0.0299	0.843	0.835	53 43.8	3 34.9	340 31.1	22 42.1	0.96750	1.30609	2.93	0.4665
12	0.0326	0.850	0.845	53 20.8	3 33.4	339 33.8	22 38.3	0.96717	1.30565	3.06	0.4860
13	0.0354	0.855	0.855	53 03.9	3 32.3	338 36.4	22 34.4	0.96699	1.30521	3.20	0.5045
14	0.0381	0.860	0.865	52 52.0	3 31.5	337 38.8	22 30.6	0.96730	1.30476	3.33	0.5222
15	0.0408	+ 0.865	+ 0.874	52 43.4	3 30.9	336 41.2	22 26.7	+0.96836	+1.30428	− 3.46	− 0.5390
16	0.0436	0.871	0.884	52 35.6	3 30.4	335 43.4	22 22.9	0.97025	1.30379	3.59	0.5551
17	0.0463	0.880	0.894	52 25.7	3 29.7	334 45.5	22 19.0	0.97287	1.30327	3.72	0.5704
18	0.0490	0.891	0.903	52 11.3	3 28.7	333 47.5	22 15.2	0.97598	1.30275	3.85	0.5851
h 19	0.0518	0.904	0.912	51 51.1	3 27.4	332 49.3	22 11.3	0.97924	1.30222	3.98	0.5992
(8.0) 20	0.0545	+ 0.919	+ 0.921	51 25.1	3 25.7	331 51.0	22 07.4	+0.98230	+1.30168	− 4.10	− 0.6127
21	0.0573	0.935	0.930	50 54.6	3 23.6	330 52.6	22 03.5	0.98483	1.30112	4.23	0.6257
22	0.0600	0.950	0.939	50 21.5	3 21.4	329 54.0	21 59.6	0.98661	1.30055	4.35	0.6381
23	0.0627	0.963	0.948	49 48.4	3 19.2	328 55.3	21 55.7	0.98758	1.29996	4.47	0.6501
24	0.0655	0.974	0.957	49 18.1	3 17.2	327 56.5	21 51.8	0.98780	1.29937	4.59	0.6616
25	0.0682	+ 0.981	+ 0.965	48 52.8	3 15.5	326 57.5	21 47.8	+0.98749	+1.29876	− 4.71	− 0.6726
26	0.0709	0.986	0.974	48 33.8	3 14.3	325 58.4	21 43.9	0.98696	1.29815	4.83	0.6833
27	0.0737	0.989	0.983	48 21.4	3 13.4	324 59.1	21 39.9	0.98654	1.29753	4.94	0.6936
28	0.0764	0.991	0.991	48 14.6	3 13.0	323 59.6	21 36.0	0.98657	1.29690	5.05	0.7035
29	0.0792	0.994	1.000	48 11.1	3 12.7	322 59.9	21 32.0	0.98729	1.29626	5.16	0.7130
30	0.0819	+ 0.998	+ 1.008	48 08.3	3 12.6	322 00.1	21 28.0	+0.98875	+1.29562	− 5.27	− 0.7222
31	0.0846	1.005	1.017	48 03.7	3 12.2	321 00.2	21 24.0	0.99084	1.29498	5.38	0.7311
Feb. 1	0.0874	1.014	1.025	47 54.5	3 11.6	320 00.1	21 20.0	0.99333	1.29433	5.49	0.7397
2	0.0901	1.025	1.033	47 39.4	3 10.6	318 59.8	21 16.0	0.99595	1.29366	5.60	0.7479
h 3	0.0929	1.037	1.040	47 18.8	3 09.3	317 59.4	21 12.0	0.99834	1.29300	5.70	0.7559
(9.0) 4	0.0956	+ 1.050	+ 1.048	46 53.7	3 07.6	316 58.8	21 07.9	+1.00018	+1.29234	− 5.80	− 0.7636
5	0.0983	1.061	1.055	46 26.1	3 05.7	315 58.0	21 03.9	1.00131	1.29169	5.90	0.7710
6	0.1011	1.071	1.063	45 58.3	3 03.9	314 57.2	20 59.8	1.00174	1.29103	6.00	0.7782
7	0.1038	1.079	1.071	45 33.1	3 02.2	313 56.1	20 55.7	1.00158	1.29035	6.10	0.7851
8	0.1065	1.084	1.078	45 12.4	3 00.8	312 54.8	20 51.6	1.00103	1.28969	6.19	0.7917
9	0.1093	+ 1.087	+ 1.085	44 57.5	2 59.8	311 53.4	20 47.6	+1.00042	+1.28904	− 6.28	− 0.7982
10	0.1120	1.089	1.092	44 48.3	2 59.2	310 51.8	20 43.5	1.00009	1.28837	6.37	0.8043
11	0.1148	1.092	1.100	44 43.5	2 58.9	309 50.0	20 39.3	1.00033	1.28772	6.46	0.8103
12	0.1175	1.095	1.107	44 41.2	2 58.7	308 48.1	20 35.2	1.00130	1.28707	6.55	0.8161
13	0.1202	1.100	1.114	44 38.7	2 58.6	307 46.0	20 31.1	1.00303	1.28643	6.63	0.8216
14	0.1230	+ 1.108	+ 1.121	44 33.4	2 58.2	306 43.8	20 26.9	+1.00540	+1.28580	− 6.71	− 0.8270
15	0.1257	+ 1.118	+ 1.127	44 23.3	2 57.5	305 41.4	20 22.8	+1.00813	+1.28517	− 6.79	− 0.8321

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f In Time.	f' In Time.	G In Arc.	G In Time.	H In Arc.	H In Time.	Log g.	Log h.	i	Log i.
	y	s	s	° '	h m	° '	h m			"	
Feb. 15	0.1257	+ 1.118	+ 1.127	44 23.3	2 57.5	305 41.4	20 22.8	+1.00813	+1.28517	− 6.79	− 0.8321
16	0.1284	1.130	1.134	44 07.7	2 56.5	304 38.8	20 18.6	1.01089	1.28454	6.87	0.8371
17	0.1312	1.143	1.140	43 46.9	2 55.1	303 36.2	20 14.4	1.01333	1.28393	6.95	0.8418
18	0.1339	1.156	1.147	43 22.5	2 53.5	302 33.4	20 10.2	1.01519	1.28332	7.02	0.8464
19	0.1367	1.167	1.153	42 56.8	2 51.8	301 30.4	20 06.0	1.01632	1.28273	7.09	0.8508
h (10.0) 20	0.1394	+ 1.176	+ 1.160	42 32.0	2 50.1	300 27.3	20 01.8	+1.01671	+1.28215	− 7.16	− 0.8550
21	0.1421	1.182	1.166	42 10.7	2 48.7	299 24.0	19 57.6	1.01649	1.28159	7.23	0.8590
22	0.1449	1.185	1.172	41 54.9	2 47.7	298 20.6	19 53.4	1.01589	1.28103	7.29	0.8629
23	0.1476	1.186	1.178	41 45.6	2 47.0	297 17.1	19 49.1	1.01522	1.28049	7.35	0.8666
24	0.1503	1.186	1.184	41 42.1	2 46.8	296 13.4	19 44.9	1.01481	1.27996	7.41	0.8701
25	0.1531	+ 1.186	+ 1.190	41 43.3	2 46.9	295 09.7	19 40.6	+1.01494	+1.27944	− 7.47	− 0.8734
26	0.1558	1.187	1.196	41 46.8	2 47.1	294 05.8	19 36.4	1.01575	1.27894	7.53	0.8766
27	0.1586	1.190	1.201	41 49.6	2 47.3	293 01.8	19 32.1	1.01724	1.27845	7.58	0.8797
28	0.1613	1.196	1.207	41 49.5	2 47.3	291 57.6	19 27.9	1.01927	1.27799	7.63	0.8826
Mar. 1	0.1640	1.204	1.212	41 44.6	2 47.0	290 53.4	19 23.6	1.02160	1.27756	7.68	0.8853
2	0.1668	+ 1.213	+ 1.218	41 34.0	2 46.3	289 49.1	19 19.3	+1.02391	+1.27712	− 7.73	− 0.8879
3	0.1695	1.224	1.224	41 18.3	2 45.2	288 44.7	19 15.0	1.02587	1.27671	7.77	0.8903
4	0.1723	1.234	1.229	40 59.2	2 43.9	287 40.2	19 10.7	1.02724	1.27632	7.81	0.8926
5	0.1750	1.242	1.234	40 38.8	2 42.6	286 35.5	19 06.4	1.02795	1.27595	7.85	0.8948
6	0.1777	1.248	1.239	40 19.6	2 41.3	285 30.8	19 02.1	1.02805	1.27560	7.89	0.8968
h (11.0) 7	0.1805	+ 1.252	+ 1.245	40 03.9	2 40.3	284 26.1	18 57.7	+1.02769	+1.27528	− 7.92	0.8986
8	0.1832	1.253	1.250	39 53.3	2 39.6	283 21.4	18 53.4	1.02713	1.27497	7.95	0.9004
9	0.1859	1.254	1.256	39 48.3	2 39.2	282 16.6	18 49.1	1.02669	1.27469	7.98	0.9019
10	0.1887	1.254	1.261	39 48.2	2 39.2	281 11.7	18 44.8	1.02667	1.27442	8.01	0.9034
11	0.1914	1.255	1.266	39 51.5	2 39.4	280 06.8	18 40.5	1.02730	1.27418	8.03	0.9047
12	0.1942	+ 1.257	+ 1.271	39 55.9	2 39.7	279 01.9	18 36.1	+1.02868	+1.27398	− 8.05	− 0.9059
13	0.1969	1.262	1.276	39 59.0	2 39.9	277 56.9	18 31.8	1.03075	1.27378	8.07	0.9069
14	0.1996	1.270	1.281	39 58.2	2 39.9	276 51.8	18 27.5	1.03333	1.27362	8.09	0.9078
15	0.2024	1.280	1.286	39 52.3	2 39.5	275 46.8	18 23.1	1.03612	1.27347	8.10	0.9086
16	0.2051	1.291	1.291	39 41.1	2 38.7	274 41.8	18 18.8	1.03876	1.27335	8.11	0.9092
17	0.2078	+ 1.303	+ 1.296	39 25.6	2 37.7	273 36.8	18 14.5	+1.04098	+1.27327	− 8.12	− 0.9097
18	0.2106	1.313	1.301	39 07.6	2 36.5	272 31.9	18 10.1	1.04257	1.27320	8.13	0.9101
19	0.2133	1.321	1.306	38 49.4	2 35.3	271 27.0	18 05.8	1.04347	1.27315	8.13	0.9103
20	0.2161	1.327	1.311	38 33.6	2 34.2	270 22.0	18 01.5	1.04373	1.27312	8.14	0.9104
21	0.2188	1.330	1.316	38 22.0	2 33.5	269 17.0	17 57.1	1.04352	1.27313	8.14	0.9104
h (12.0) 22	0.2215	+ 1.331	+ 1.321	38 16.1	2 33.1	268 12.2	17 52.8	+1.04312	+1.27316	− 8.13	−· 0.9102
23	0.2243	1.330	1.326	38 16.2	2 33.1	267 07.4	17 48.5	1.04287	1.27322	8.13	0.9100
24	0.2270	1.329	1.331	38 21.2	2 33.4	266 02.6	17 44.2	1.04304	1.27328	8.12	0.9096
25	0.2297	1.329	1.336	38 29.2	2 33.9	264 57.9	17 39.8	1.04381	1.27339	8.11	0.9090
26	0.2325	1.330	1.340	38 37.8	2 34.5	263 53.2	17 35.5	1.04524	1.27352	8.10	0.9083
27	0.2352	+ 1.334	+ 1.345	38 44.4	2 35.0	262 48.7	17 31.2	+1.04728	+1.27367	− 8.08	− 0.9075
28	0.2380	1.341	1.351	38 47.1	2 35.1	261 44.3	17 26.9	1.04972	1.27384	8.06	0.9066
29	0.2407	1.350	1.356	38 44.6	2 35.0	260 39.9	17 22.7	1.05225	1.27403	8.04	0.9055
30	0.2434	1.359	1.360	38 36.9	2 34.5	259 35.7	17 18.4	1.05459	1.27424	8.02	0.9043
31	0.2462	1.369	1.365	38 25.0	2 33.7	258 31.5	17 14.1	1.05650	1.27448	8.00	0.9030
Apr. 1	0.2489	+ 1.378	+ 1.371	38 10.9	2 32.7	257 27.3	17 09.8	+1.05785	+1.27475	− 7.97	− 0.9016
2	0.2517	+ 1.385	+ 1.376	37 56.6	2 31.8	256 23.4	17 05.6	+1.05857	+1.27504	− 7.94	0.9000

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f	f'	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° '	h m	° '	h m			"	
Apr. 1	0.2489	+ 1.378	+ 1.371	38 10.9	2 32.7	257 27.3	17 09.8	+1.05785	+1.27475	− 7.97	− 0.9016
2	0.2517	1.385	1.376	37 56.6	2 31.8	256 23.4	17 05.6	1.05857	1.27504	7.94	0.9000
3	0.2544	1.389	1.381	37 45.1	2 31.0	255 19.5	17 01.3	1.05881	1.27534	7.91	0.8982
4	0.2571	1.391	1.386	37 37.5	2 30.5	254 15.8	16 57.0	1.05877	1.27566	7.88	0.8964
h 5	0.2599	1.392	1.392	37.35.0	2 30.3	253 12.3	16 52.8	1.05873	1.27601	7.84	0.8944
(13.0) 6	0.2626	+ 1.392	+ 1.397	37 37.5	2 30.5	252 08.8	16 48.6	+1.05899	+1.27639	− 7.80	− 0.8922
7	0.2653	1.393	1.403	37 43.8	2 30.9	251 05.6	16 44.4	1.05979	1.27677	7.76	0.8900
8	0.2681	1.395	1.408	37 51.8	2 31.5	250 02.5	16 40.2	1.06126	1.27717	7.72	0.8876
9	0.2708	1.399	1.413	37 59.2	2 31.9	248 59.6	16 36.0	1.06343	1.27759	7.67	0.8850
10	0.2736	1.406	1.419	38 03.8	2 32.3	247 56.7	16 31.8	1.06616	1.27804	7.62	0.8823
11	0.2763	+ 1.417	+ 1.425	38 03.9	2 32.3	246 54.1	16 27.6	+1.06920	+1.27849	− 7.58	− 0.8795
12	0.2790	1.428	1.430	37 58.8	2 31.9	245 51.6	16 23.4	1.07225	1.27896	7.53	0.8765
13	0.2818	1.440	1.435	37 48.9	2 31.3	244 49.3	16 19.3	1.07500	1.27944	7.47	0.8734
14	0.2845	1.452	1.441	37 35.9	2 30.4	243 47.2	16 15.1	1.07724	1.27995	7.42	0.8701
15	0.2872	1.462	1.447	37 21.7	2 29.4	242 45.3	16 11.0	1.07886	1.28046	7.36	0.8667
16	0.2900	+ 1.470	+ 1.454	37 08.5	2 28.6	241 43.6	16 06.9	+1.07986	+1.28098	− 7.30	− 0.8631
17	0.2927	1.475	1.460	36 58.6	2 27.9	240 42.1	16 02.8	1.08036	1.28152	7.23	0.8594
18	0.2955	1.477	1.466	36 53.5	2 27.6	239 40.7	15 58.7	1.08058	1.28206	7.17	0.8555
19	0.2982	1.478	1.472	36 53.8	2 27.6	238 39.5	15 54.6	1.08081	1.28264	7.11	0.8514
20	0.3009	1.478	1.478	36 58.9	2 27.9	237 38.4	15 50.6	1.08135	1.28322	7.04	0.8472
h 21	0.3037	+ 1.479	+ 1.485	37 07.2	2 28.5	236 37.6	15 46.5	+1.08240	+1.28379	− 6.96	− 0.8428
(14.0) 22	0.3064	1.481	1.491	37 16.9	2 29.1	235 37.0	15 42.5	1.08404	1.28439	6.89	0.8383
23	0.3091	1.486	1.497	37 25.5	2 29.7	234 36.6	15 38.4	1.08625	1.28499	6.82	0.8336
24	0.3119	1.493	1.503	37 30.8	2 30.1	233 36.3	15 34.4	1.08890	1.28559	6.74	0.8287
25	0.3146	1.503	1.510	37 31.4	2 30.1	232 36.3	15 30.4	1.09177	1.28619	6.66	0.8236
26	0.3174	+ 1.514	+ 1.517	37 27.0	2 29.8	231 36.5	15 26.4	+1.09455	+1.28682	− 6.58	− 0.8183
27	0.3201	1.526	1.524	37 18.2	2 29.2	230 36.9	15 22.5	1.09700	1.28745	6.50	0.8129
28	0.3228	1.536	1.531	37 06.5	2 28.4	229 37.5	15 18.5	1.09896	1.28808	6.42	0.8072
29	0.3256	1.546	1.538	36 54.1	2 27.6	228 38.3	15 14.6	1.10036	1.28870	6.33	0.8014
30	0.3283	1.553	1.545	36 43.0	2 26.9	227 39.4	15 10.6	1.10127	1.28932	6.24	0.7953
May 1	0.3311	+ 1.557	+ 1.551	36 35.0	2 26.3	226 40.5	15 06.7	+1.10183	+1.28996	− 6.15	− 0.7891
2	0.3338	1.560	1.558	36 31.2	2 26.1	225 41.9	15 02.8	1.10228	1.29059	6.06	0.7826
3	0.3365	1.562	1.566	36 32.0	2 26.1	224 43.5	14 58.9	1.10291	1.29122	5.97	0.7759
4	0.3393	1.564	1.573	36 36.5	2 26.4	223 45.4	14 55.0	1.10396	1.29186	5.88	0.7690
5	0.3420	1.568	1.581	36 43.2	2 26.9	222 47.4	14 51.2	1.10559	1.29250	5.78	0.7619
h 6	0.3447	+ 1.574	+ 1.589	36 50.0	2 27.3	221 49.5	14 47.3	+1.10784	+1.29313	5.68	− 0.7545
(15.0) 7	0.3475	1.582	1.596	36 54.7	2 27.6	220 51.9	14 43.5	1.11063	1.29375	5.58	0.7468
8	0.3502	1.594	1.604	36 55.6	2 27.7	219 54.5	14 39.6	1.11377	1.29438	5.48	0.7389
9	0.3530	1.607	1.611	36 51.8	2 27.5	218 57.2	14 35.8	1.11703	1.29500	5.38	0.7307
10	0.3557	1.621	1.619	36 43.4	2 26.9	218 00.2	14 32.0	1.12013	1.29561	5.28	0.7223
11	0.3584	+ 1.635	+ 1.626	36 31.5	2 26.1	217 03.3	14 28.2	+1.12280	+1.29622	− 5.17	− 0.7135
12	0.3612	1.648	1.634	36 17.6	2 25.2	216 06.7	14·24.4	1.12491	1.29683	5.07	0.7045
13	0.3639	1.659	1.643	36 03.9	2 24.3	215 10.2	14 20.7	1.12645	1.29743	4.96	0.6952
14	0.3666	1.667	1.651	35 52.4	2 23.5	214 13.9	14 16.9	1.12751	1.29803	4.85	0.6855
15	0.3694	1.673	1.660	35 44.5	2 23.0	213 17.8	14 13.2	1.12822	1.29861	4.74	0.6755
16	0.3721	+ 1.676	+ 1.668	35 41.4	2 22.8	212 21.8	14 09.5	+1.12882	+1.29918	− 4.63	− 0.6651
17	0.3749	+ 1.679	+ 1.677	35 42.8	2 22.8	211 26.0	14 05.7	+1.12959	+1.29974	− 4.51	− 0.6543

CONSTANTS OF STRUVE AND PETERS.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day (Sid. Hour)		τ	*f* In Time	*f* In Time	G In Arc	G In Time	H In Arc	H In Time	Log	Log	i	Log
May	17	0.5749	−1.679	−1.677	35 42.5	2 22.8	211 26.6	14 05.7	+1.12959	−1.29974	−4.51	−0.554
	18	0.5776	1.681	1.685	35 47.5	2 23.2	210 30.4	14 02.0	1.13075	1.30030	4.40	0.643
	19	0.5803	1.685	1.693	35 53.9	2 23.6	209 34.9	13 58.3	1.13241	1.30084	4.29	0.636
	20	0.5830	1.692	1.702	36 00.1	2 24.0	208 33.6	13 54.6	1.13459	1.30137	4.17	0.619
	21	0.5857	1.700	1.710	36 03.9	2 24.3	207 44.5	13 51.6	1.13720	1.30190	4.05	0.607
(16.0)	22	0.3885	+1.712	+1.719	36 03.9	2 24.3	206 49.4	13 47.3	+1.14005	−1.30241	−3.93	−0.591
	23	0.3913	1.725	1.729	35 59.3	2 23.9	205 54.6	13 43.6	1.14291	1.30291	3.81	0.581
	24	0.3940	1.738	1.738	35 50.4	2 23.4	205 00.6	13 40.0	1.14555	1.30340	3.69	0.566
	25	0.3968	1.752	1.747	35 38.4	2 22.6	204 05.4	13 36.4	1.14775	1.30388	3.57	0.552
	26	0.3995	1.764	1.756	35 24.9	2 21.7	203 10.9	13 32.7	1.14950	1.30436	3.45	0.537
	27	0.4022	+1.774	+1.765	35 11.8	2 20.8	202 16.7	13 29.1	+1.15074	+1.30481	−3.32	−0.528
	28	0.4050	1.781	1.774	35 00.7	2 20.0	201 22.5	13 25.5	1.15192	1.30523	3.20	0.504
	29	0.4077	1.787	1.784	34 53.1	2 19.5	200 28.4	13 21.9	1.15230	1.30564	3.07	0.485
	30	0.4105	1.791	1.793	34 49.7	2 19.3	199 34.5	13 18.3	1.15301	1.30605	2.94	0.484
	31	0.4132	1.795	1.802	34 49.9	2 19.3	198 40.7	13 14.7	1.15400	1.30644	2.81	0 449
June	1	0.4159	+1.800	+1.812	34 52.6	2 19.5	197 47.0	13 11.1	+1.15546	+1.30680	−2.69	−0.420
	2	0.4187	1.817	1.821	34 56.1	2 19.7	196 53.5	13 07.6	1.15746	1.30715	2.56	0.407
	3	0.4214	1.817	1.830	34 58.3	2 19.9	196 00.0	13 04.0	1.15996	1.30750	2.43	0.385
	4	0.4241	1.829	1.840	34 57.8	2 19.8	195 06.5	13 00.4	1.16283	1.30783	2.30	0.361
	5	0.4269	1.843	1.849	34 53.3	2 19.6	194 13.2	12 56.9	1.16588	1.30813	2.17	0.335
(17.0)	6	0.4296	+1.859	+1.859	34 44.4	2 19.0	193 20.0	12 53.3	+1.16887	+1.30843	−2.04	−0.308
	7	0.4324	1.876	1.869	34 31.9	2 18.1	192 26.8	12 49.8	1.17156	1.30870	1.91	0.295
	8	0.4351	1.891	1.879	34 17.0	2 17.1	191 33.8	12 46.3	1.17378	1.30895	1.77	0.248
	9	0.4378	1.904	1.889	34 01.6	2 16.0	190 40.8	12 42.7	1.17548	1.30920	1.64	0.214
	10	0.4406	1.915	1.899	33 47.2	2 15.1	189 47.9	12 39.2	1.17669	1.30941	1.50	0.177
	11	0.4433	+1.923	+1.909	33 35.7	2 14.4	188 55.1	12 35.7	+1.17752	+1.30961	−1.37	0.137
	12	0.4460	1.928	1.919	33 28.1	2 13.9	188 02.3	12 32.2	1.17816	1.30979	1.24	0.092
	13	0.4488	1.933	1.929	33 24.7	2 13.6	187 09.5	12 28.6	1.17882	1.30995	1.11	0.045
	14	0.4515	1.936	1.939	33 24.8	2 13.7	186 16.8	12 25.1	1.17972	1.31010	0.97	0.004
	15	0.4543	1.941	1.948	33 27.1	2 13.8	185 24.2	12 21.6	1.18102	1.31023	0.83	9.9213
	16	0.4570	+1.948	+1.958	33 29.9	2 14.0	184 31.5	12 18.1	+1.18279	+1.31034	−0.69	−9.9447
	17	0.4597	1.958	1.968	33 31.4	2 14.1	183 39.0	12 14.6	1.18498	1.31042	0.56	9.7515
	18	0.4625	1.969	1.975	33 29.9	2 14.0	182 46.4	12 11.1	1.18745	1.31049	0.43	9.6425
	19	0.4652	1.983	1.988	33 24.5	2 13.6	181 53.9	12 07.6	1.19001	1.31055	0.30	9.4
	20	0.4679	1.995	1.998	33 15.2	2 13.0	181 01.3	12 04.1	1.19245	1.31050	0.16	9.1
(18.0)	21	0.4707	+2.012	+2.008	33 02.5	2 12.2	180 08.8	12 00.6	+1.19456	+1.31059	−0.02	8.357
	22	0.4734	2.026	2.018	32 47.8	2 11.2	179 16.3	11 57.1	1.19623	1.31059	+0.11	−0.052
	23	0.4762	2.037	2.028	32 32.8	2 10.2	178 23.8	11 53.6	1.19744	1.31055	0.25	9.844
	24	0.4789	2.046	2.038	32 19.2	2 09.3	177 31.3	11 50.1	1.19826	1.31050	0.38	9.55
	25	0.4816	2.053	2.048	32 08.3	2 08.6	176 38.8	11 46.6	1.19882	1.31044	0.52	9.724
	26	0.4844	+2.058	+2.058	32 00.9	2 08.1	175 46.3	11 43.1	+1.19931	+1.31037	+0.65	+9.8153
	27	0.4871	2.062	2.068	31 57.1	2 07.8	174 53.7	11 39.6	1.19996	1.31027	0.70	9.86
	28	0.4898	2.067	2.078	31 56.1	2 07.7	174 01.2	11 36.1	1.20096	1.31015	0.92	9.895
	29	0.4926	2.074	2.088	31 56.7	2 07.8	173 08.6	11 32.6	1.20241	1.31002	1.06	9.924
	30	0.4953	2.083	2.098	31 56.9	2 07.8	172 15.9	11 29.1	1.20432	1.30984	1.19	9.9
July	1	0.4981	+2.095	+2.108	31 55.3	2 07.7	171 23.3	11 25.6	+1.20663	+1.30967	+1.32	+0.122
	2	0.5008	+2.100	+2.117	31 50.4	2 07.4	170 30.6	11 22.0	+1.20918	+1.30948	+1.46	−0.154

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. Sid. Hour.		τ	f In Time.	f' In Time.	G In Arc	G In Time.	H In Arc	H In Time.	Log g.	Log h.	i	Log i.
		y	s	s	° ′	h m	° ′	h m			″	
July	1	0.4981	+ 2.095	+ 2.108	31 55.3	2 07.7	171 23.3	11 25.6	+1.20063	+1.30967	+ 1.32	+ 0.1223
	2	0.5008	2.109	2.117	31 50.4	2 07.4	170 30.6	11 22.0	1.20918	1.30948	1.46	0.1640
	3	0.5035	2.125	2.127	31 41.8	2 06.8	169 37.8	11 18.5	1.21175	1.30927	1.59	0.2018
	4	0.5063	2.141	2.137	31 29.6	2 06.0	168 45.0	11 15.0	1.21414	1.30903	1.73	0.2366
	5	0.5090	2.157	2.147	31 14.7	2 05.0	167 52.1	11 11.5	1.21617	1.30878	1.86	0.2686
h (19.0)	6	0.5118	+ 2.171	+ 2.157	30 58.5	2 03.9	166 59.2	11 07.9	+1.21774	+1.30853	+ 1.99	+ 0.2984
	7	0.5145	2.182	2.166	30 42.7	2 02.9	166 06.3	11 04.4	1.21882	1.30825	2.12	0.3261
	8	0.5172	2.191	2.176	30 28.9	2 01.9	165 13.2	11 00.9	1.21949	1.30794	2.25	0.3520
	9	0.5200	2.197	2.186	30 18.5	2 01.2	164 19.9	10 57.3	1.21990	1.30762	2.38	0.3764
	10	0.5227	2.201	2.195	30 11.8	2 00.8	163 26.7	10 53.8	1.22025	1.30730	2.51	0.3993
	11	0.5254	+ 2.205	+ 2.204	30 08.7	2 00.6	162 33.4	10 50.2	+1.22073	+1.30695	+ 2.64	+ 0.4210
	12	0.5282	2.209	2.214	30 08.3	2 00.6	161 39.9	10 46.7	1.22151	1.30658	2.77	0.4416
	13	0.5309	2.214	2.223	30 09.2	2 00.6	160 46.4	10 43.1	1.22268	1.30620	2.89	0.4611
	14	0.5337	2.222	2.232	30 09.7	2 00.6	159 52.8	10 39.5	1.22425	1.30580	3.02	0.4797
	15	0.5364	2.232	2.241	30 08.1	2 00.5	158 59.0	10 35.9	1.22613	1.30539	3.14	0.4973
	16	0.5391	+ 2.245	+ 2.251	30 03.3	2 00.2	158 05.2	10 32.3	+1.22817	+1.30496	+ 3.27	+ 0.5142
	17	0.5419	2.258	2.260	29 54.9	1 59.7	157 11.2	10 28.7	1.23018	1.30453	3.39	0.5303
	18	0.5446	2.272	2.269	29 43.1	1 58.9	156 17.2	10 25.1	1.23197	1.30407	3.52	0.5458
	19	0.5473	2.285	2.278	29 29.1	1 57.9	155 23.0	10 21.5	1.23340	1.30360	3.64	0.5606
	20	0.5501	2.296	2.287	29 14.1	1 56.9	154 28.7	10 17.9	1.23441	1.30313	3.76	0.5747
h (20.0)	21	0.5528	+ 2.305	+ 2.296	28 59.6	1 56.0	153 34.2	10 14.3	+1.23502	+1.30264	+ 3.88	+ 0.5884
	22	0.5556	2.311	2.305	28 47.4	1 55.2	152 39.6	10 10.6	1.23533	1.30213	4.00	0.6015
	23	0.5583	2.315	2.314	28 38.1	1 54.5	151 44.0	10 07.0	1.23550	1.30161	4.11	0.6141
	24	0.5610	2.318	2.322	28 32.4	1 54.2	150 50.1	10 03.3	1.23571	1.30108	4.23	0.6262
	25	0.5638	2.321	2.330	28 29.9	1 54.0	149 55.1	9 59.7	1.23614	1.30054	4.34	0.6379
	26	0.5665	+ 2.326	+ 2.339	28 29.3	1 53.9	148 59.0	9 56.0	+1.23605	+1.30000	+ 4.46	+ 0.6492
	27	0.5692	2.333	2.348	28 29.2	1 53.9	148 04.5	9 52.3	1.23821	1.29945	4.57	0.6600
	28	0.5720	2.342	2.356	28 28.2	1 53.9	147 09.1	9 48.6	1.23989	1.29888	4.68	0.6705
	29	0.5747	2.354	2.364	28 25.0	1 53.7	146 13.5	9 44.9	1.24185	1.29830	4.79	0.6805
	30	0.5775	2.368	2.372	28 18.5	1 53.2	145 17.7	9 41.2	1.24392	1.29772	4.90	0.6904
	31	0.5802	+ 2.382	+ 2.380	28 08.5	1 52.6	144 21.8	9 37.5	+1.24592	+1.29713	+ 5.01	+ 0.6998
Aug.	1	0.5829	2.396	2.388	27 55.6	1 51.7	143 25.6	9 33.7	1.24766	1.29654	5.12	0.7090
	2	0.5857	2.409	2.396	27 40.9	1 50.7	142 29.3	9 30.0	1.24900	1.29593	5.22	0.7178
	3	0.5884	2.420	2.404	27 25.9	1 49.7	141 32.9	9 26.2	1.24989	1.29532	5.33	0.7263
	4	0.5912	2.427	2.411	27 12.2	1 48.8	140 36.3	9 22.4	1.25036	1.29471	5.43	0.7345
h (21.0)	5	0.5939	+ 2.432	+ 2.419	27 01.1	1 48.0	139 39.5	9 18.6	+1.25053	+1.29409	+ 5.53	+ 0.7425
	6	0.5966	2.435	2.427	26 53.5	1 47.6	138 42.6	9 14.8	1.25054	1.29347	5.63	0.7502
	7	0.5994	2.437	2.435	26 49.6	1 47.3	137 45.4	9 11.0	1.25059	1.29285	5.73	0.7577
	8	0.6021	2.439	2.442	26 48.7	1 47.2	136 48.0	9 07.2	1.25057	1.29222	5.82	0.7649
	9	0.6048	2.442	2.450	26 49.7	1 47.3	135 50.4	9 03.4	1.25147	1.29160	5.92	0.7710
	10	0.6076	+ 2.447	+ 2.457	26 51.2	1 47.4	134 52.8	8 59.5	+1.25245	+1.29097	+ 6.01	+ 0.7787
	11	0.6103	2.454	2.464	26 51.5	1 47.4	133 54.9	8 55.7	1.25377	1.29035	6.10	0.7852
	12	0.6131	2.464	2.471	26 49.2	1 47.3	132 56.8	8 51.8	1.25531	1.28972	6.19	0.7915
	13	0.6158	2.475	2.478	26 43.6	1 46.9	131 58.4	8 47.9	1.25692	1.28909	6.28	0.7976
	14	0.6185	2.480	2.484	26 34.8	1 46.3	130 59.9	8 44.0	1.25841	1.28846	6.37	0.8035
	15	0.6213	+ 2.497	+ 2.491	26 23.4	1 45.6	130 01.3	8 40.1	+1.25962	+1.28784	+ 6.45	+ 0.8093
	16	0.6240	+ 2.507	+ 2.498	26 10.6	1 44.7	129 02.5	8 36.2	+1.26046	+1.28722	+ 6.53	+ 0.8148

INDEPENDENT STAR-NUMBERS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. / Sid. Hour.		τ	f In Time.	f' In Time.	G In Arc.	G In Time.	H In Arc.	H In Time.	Log g.	Log h.	i	Log i.
		y	s	s	° '	h m	° '	h m			"	
A R	16	0.6240	+ 2.507	+ 2.498	26 10.6	1 44.7	129 02.	8 36.2	+1.26046	+1.28722	+ 6.53	+ 0.8148
	17	0.6267	2.514	2.505	25 57.9	1 43.9	128 03.5	8 32.2	1.26090	1.28661	6.61	0.8201
	18	0.6295	2.519	2.512	25 46.6	1 43.1	127 04..	8 28.3	1.26100	1.28600	6.69	0.8252
	19	0.6322	2.521	2.518	25 37.9	1 42.5	126 04.8	8 24.3	1.26090	1.28540	6.77	0.8302
h	20	0.6350	2.522	2.524	25 32.5	1 42.2	125 05.	8 20.	1.26077	1.28480	6.84	0.8350
(22.0)	21	0.6377	+ 2.523	+ 2.531	25 30.4	1 42.0	124 05.4	8 16.4	+1.26079	+1.28420	+ 6.91	+ 0.8396
	22	0.6404	2.525	2.537	25 30.9	1 42.1	123 05.3	8 12.3	1.26112	1.28362	6.98	0.8441
	23	0.6432	2.528	2.543	25 32.8	1 42.2	122 05.	8 08.3	1.26186	1.28305	7.05	0.8484
	24	0.6459	2.534	2.549	25 34.4	1 42.3	121 04.6	8 04.3	1.26301	1.28249	7.12	0.8525
	25	0.6486	2.543	2.555	25 34.2	1 42.3	120 04.4	8 00.3	1.26450	1.28194	7.19	0.8564
	26	0.6514	+ 2.554	+ 2.561	25 31.3	1 42.1	119 03.7	7 56.2	+1.26620	+1.28140	+ 7.25	+ 0.8602
	27	0.6541	2.567	2.567	25 25.2	1 41.7	118 02.8	7 52.2	1.26792	1.28087	7.31	0.8639
	28	0.6569	2.579	2.573	25 16.1	1 41.1	117 01.8	7 48.1	1.26946	1.28035	7.37	0.8674
	29	0.6596	2.590	2.579	25 04.9	1 40.3	116 00.6	7 44.0	1.27067	1.27985	7.43	0.8708
	30	0.6523	2.599	2.584	24 52.7	1 39.5	114 59.1	7 39.9	1.27148	1.27935	7.48	0.8740
	31	0.6651	+ 2.606	+ 2.590	24 41.2	1 38.7	113 57.5	7 35.8	+1.27189	+1.27887	+ 7.54	+ 0.8770
Sept.	1	0.6678	2.609	2.595	24 31.8	1 38.1	112 55.8	7 31.7	1.27196	1.27841	7.59	0.8800
	2	0.6706	2.611	2.600	24 25.5	1 37.7	111 53.9	7 27.6	1.27182	1.27797	7.64	0.8827
	3	0.6733	2.611	2.606	24 22.8	1 37.5	110 51.8	7 23.5	1.27165	1.27753	7.68	0.8854
	4	0.6760	2.610	2.612	24 23.3	1 37.6	109 49.6	7 19.3	1.27161	1.27712	7.73	0.8879
h	5	0.6788	+ 2.611	+ 2.617	24 26.2	1 37.7	108 47.2	7 15.1	+1.27180	+1.27672	+ 7.77	0.8902
(23.0)	6	0.6815	2.613	2.622	24 30.2	1 38.0	107 44.7	7 11.0	1.27249	1.27634	7.81	0.8925
	7	0.6842	2.618	2.628	24 33.6	1 38.2	106 42.1	7 06.8	1.27348	1.27598	7.85	0.8946
	8	0.6870	2.625	2.633	24 35.2	1 38.3	105 39.3	7 02.6	1.27473	1.27565	7.88	0.8965
	9	0.6897	2.633	2.638	24 33.9	1 38.3	104 36.4	6 58.4	1.27611	1.27533	7.91	0.8984
	10	0.6925	+ 2.643	+ 2.643	24 29.4	1 38.0	103 33.5	6 54.2	+1.27747	+1.27502	+ 7.94	+ 0.9000
	11	0.6952	2.653	2.648	24 22.2	1 37.5	102 30.3	6 50.0	1.27863	1.27474	7.97	0.9016
	12	0.6979	2.661	2.653	24 13.2	1 36.9	101 27.0	6 45.8	1.27947	1.27449	8.00	0.9031
	13	0.7007	2.667	2.658	24 03.5	1 36.2	100 23.7	6 41.6	1.27994	1.27425	8.02	0.9044
	14	0.7034	2.671	2.663	23 54.7	1 35.7	99 20.3	6 37.4	1.28006	1.27404	8.04	0.9055
	15	0.7061	+ 2.673	+ 2.668	23 48.2	1 35.2	98 16.7	6 33.1	+1.27994	+1.27384	+ 8.06	+ 0.9066
	16	0.7089	2.673	2.673	23 44.8	1 35.0	97 13.1	6 28.9	1.27973	1.27366	8.08	0.9075
	17	0.7116	2.672	2.678	23 44.7	1 35.0	96 09.4	6 24.6	1.27961	1.27352	8.10	0.9083
	18	0.7144	2.672	2.683	23 47.4	1 35.2	95 05.7	6 20.4	1.27974	1.27340	8.11	0.9090
h	19	0.7171	2.673	2.687	23 51.8	1 35.5	94 01.9	6 16.1	1.28026	1.27330	8.12	0.9095
(0.0)	20	0.7198	+ 2.677	+ 2.692	23 56.6	1 35.8	92 57.9	6 11.9	+1.28119	+1.27322	+ 8.13	0.9099
	21	0.7226	2.684	2.697	24 00.3	1 36.0	91 53.9	6 07.6	1.28249	1.27316	8.13	0.9102
	22	0.7253	2.693	2.702	24 01.7	1 36.1	90 49.9	6 03.3	1.28405	1.27314	8.14	0.9104
	23	0.7280	2.704	2.707	24 00.1	1 36.0	89 45.8	5 59.1	1.28572	1.27313	8.14	0.9104
	24	0.7308	2.716	2.712	23 55.4	1 35.7	88 41.7	5 54.8	1.28730	1.27314	8.13	0.9103
	25	0.7335	+ 2.727	+ 2.717	23 48.2	1 35.2	87 37.6	5 50.5	+1.28863	+1.27318	+ 8.13	0.9101
	26	0.7363	2.736	2.722	23 39.7	1 34.6	86 33.4	5 46.2	1.28960	1.27320	8.12	0.9098
	27	0.7390	2.742	2.726	23 31.3	1 34.1	85 29.3	5 42.0	1.29017	1.27334	8.11	0.9093
	28	0.7417	2.746	2.731	23 24.4	1 33.6	84 25.1	5 37.7	1.29040	1.27345	8.10	0.9087
	29	0.7445	2.748	2.737	23 20.1	1 33.3	83 21.0	5 33.4	1.29042	1.27358	8.09	0.9079
	30	0.7472	+ 2.747	+ 2.742	23 19.2	1 33.3	82 16.9	5 29.1	+1.29034	+1.27374	+ 8.07	0.9071
Oct.	1	0.7500	+ 2.746	+ 2.747	23 21.6	1 33.4	81 12.7	5 24.8	+1.29032	+1.27363	+ 8.06	+ 0.9061

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f In Time.	f' In Time.	G In Arc.	G In Time.	H In Arc.	H In Time.	Log g.	Log h.	i	Log i.
	y	s	s	° ′	h m	° ′	h m			″	
Oct. 1	0.7500	+ 2.740	+ 2.747	23 21.6	1 33.4	81 12.7	5 24.8	+1.29032	+1.27393	+ 8.06	+ 0.9061
2	0.7527	2.740	2.752	23 26.6	1 33.8	80 08.5	5 20.6	1.29058	1.27414	8.04	0.9050
3	0.7554	2.748	2.757	23 33.0	1 34.2	79 04.4	5 16.3	1.29115	1.27437	8.01	0.9037
4	0.7581	2.751	2.7	23 39.6	1 34.6	78 00.3	5 12.0	1.29210	1.27462	7.99	0.9023
5	0.7609	2.758	2.767	23 44.6	1 35.0	76 56.3	5 07.8	1.29336	1.27489	7.96	0.9008
h (1.0) 6	0.7636	+ 2.760	+ 2.772	23 47.1	1 35.1	75 52.3	5 03.5	+1.29481	+1.27518	+ 7.93	+ 0.8991
7	0.7664	2.770	2.777	23 46.6	1 35.1	74 48.4	4 59.2	1.29529	1.27550	7.89	0.8973
8	0.7691	2.785	2.782	23 43.1	1 34.9	73 44.6	4 55.0	1.29764	1.27584	7.86	0.8954
9	0.7719	2.791	2.787	23 37.6	1 34.5	72 40.8	4 50.7	1.29873	1.27620	7.82	0.8933
10	0.7746	2.802	2.793	23 30.9	1 34.1	71 37.1	4 46.5	1.29949	1.27658	7.78	0.8911
11	0.7773	+ 2.807	+ 2.798	23 24.7	1 33.6	70 33.4	4 42.2	+1.29991	+1.27697	+ 7.74	+ 0.8888
12	0.7801	2.809	2.803	23 20.2	1 33.3	69 29.9	4 38.0	1.30006	1.27739	7.70	0.8863
13	0.7828	2.810	2.809	23 18.3	1 33.2	68 26.4	4 33.8	1.30009	1.27783	7.65	0.8836
14	0.7855	2.810	2.814	23 19.5	1 33.3	67 23.0	4 29.5	1.30014	1.27827	7.60	0.8808
15	0.7883	2.810	2.819	23 23.5	1 33.6	66 19.7	4 25.3	1.30039	1.27874	7.55	0.8779
16	0.7910	+ 2.812	+ 2.825	23 29.6	1 34.0	65 16.5	4 21.1	+1.30099	+1.27923	+ 7.50	+ 0.8748
17	0.7938	2.816	2.831	23 36.4	1 34.4	64 13.4	4 16.9	1.30199	1.27974	7.44	0.8715
18	0.7965	2.822	2.837	23 42.6	1 34.8	63 10.5	4 12.7	1.30337	1.28026	7.38	0.8681
19	0.7992	2.832	2.843	23 46.8	1 35.1	62 07.6	4 08.5	1.30505	1.28079	7.32	0.8645
20	0.8020	2.843	2.848	23 48.2	1 35.2	61 04.9	4 04.3	1.30690	1.28133	7.26	0.8608
h (2.0) 21	0.8047	+ 2.856	+ 2.854	23 46.5	1 35.1	60 02.3	4 00.2	+1.30871	+1.28189	+ 7.19	+ 0.8569
22	0.8074	2.868	2.860	23 42.1	1 34.8	58 59.8	3 56.0	1.31035	1.28247	7.13	0.8528
23	0.8102	2.880	2.867	23 36.0	1 34.4	57 57.5	3 51.8	1.31170	1.28305	7.06	0.8486
24	0.8129	2.889	2.873	23 29.4	1 34.0	56 55.3	3 47.7	1.31267	1.28363	6.99	0.8441
25	0.8157	2.895	2.880	23 23.8	1 33.6	55 53.2	3 43.5	1.31329	1.28422	6.91	0.8395
26	0.8184	+ 2.898	+ 2.886	23 20.2	1 33.3	54 51.3	3 39.4	+1.31356	+1.28483	+ 6.84	+ 0.8347
27	0.8211	2.900	2.893	23 19.5	1 33.3	53 49.5	3 35.3	1.31390	1.28545	6.76	0.8297
28	0.8239	2.901	2.899	23 22.1	1 33.5	52 47.9	3 31.2	1.31419	1.28608	6.68	0.8246
29	0.8266	2.902	2.906	23 27.4	1 33.8	51 46.4	3 27.1	1.31465	1.28671	6.59	0.8192
30	0.8294	2.906	2.913	23 34.2	1 34.3	50 45.1	3 23.0	1.31542	1.28735	6.51	0.8136
31	0.8321	+ 2.910	+ 2.920	23 41.5	1 34.8	49 43.9	3 18.9	+1.31654	+1.28800	+ 6.42	+ 0.8078
Nov. 1	0.8348	2.917	2.926	23 47.7	1 35.2	48 42.8	3 14.9	1.31799	1.28865	6.34	0.8018
2	0.8376	2.927	2.933	23 51.7	1 35.4	47 41.8	3 10.8	1.31965	1.28929	6.25	0.7956
3	0.8403	2.938	2.940	23 52.7	1 35.5	46 41.1	3 06.7	1.32140	1.28995	6.16	0.7891
4	0.8430	2.950	2.948	23 50.9	1 35.4	45 40.5	3 02.7	1.32307	1.29061	6.06	0.7824
h (3.0) 5	0.8458	+ 2.962	+ 2.955	23 46.7	1 35.1	44 40.1	2 58.7	+1.32451	+1.29126	+ 5.96	+ 0.7755
6	0.8485	2.971	2.962	23 41.1	1 34.7	43 39.8	2 54.7	1.32566	1.29192	5.86	0.7683
7	0.8513	2.979	2.970	23 35.2	1 34.3	42 39.7	2 50.6	1.32649	1.29258	5.76	0.7609
8	0.8540	2.983	2.978	23 30.5	1 34.1	41 39.7	2 46.6	1.32704	1.29323	5.66	0.7532
9	0.8567	2.983	2.985	23 28.0	1 33.9	40 39.8	2 42.7	1.32740	1.29389	5.56	0.7452
10	0.8595	+ 2.991	+ 2.993	23 28.3	1 33.9	39 40.1	2 38.7	+1.32776	+1.29454	+ 5.46	+ 0.7369
11	0.8622	2.993	3.001	23 31.2	1 34.1	38 40.5	2 34.7	1.32826	1.29518	5.35	0.7283
12	0.8649	2.997	3.009	23 36.2	1 34.4	37 41.2	2 30.7	1.32904	1.29582	5.24	0.7194
13	0.8677	3.002	3.017	23 42.2	1 34.8	36 41.9	2 26.8	1.33019	1.29646	5.13	0.7102
14	0.8704	3.010	3.025	23 48.0	1 35.2	35 42.7	2 22.8	1.33170	1.29709	5.02	0.7006
15	0.8732	+ 3.021	+ 3.033	23 52.1	1 35.5	34 43.8	2 18.9	+1.33352	+1.29771	+ 4.91	+ 0.6907
16	0.8759	+ 3.035	+ 3.042	23 53.7	1 35.6	33 45.0	2 15.0	+1.33553	+1.29832	+ 4.79	+ 0.6804

INDEPENDENT STAR-NUMBERS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

FOR WASHINGTON MEAN MIDNGHT.

		z	f In Time	f' In Time	G In Arc	G In Time	H In Arc	H In Time	Log g	Log h	i	Log i
			s	s	° '	h m	° '	h m			"	
Nov	16	0.8759	+ 3.035	+ 3.042	23 53.7	1 35.6	33 45.0	2 15.0	+1.33553	+1.29832	+ 4.79	+ 0.6804
	17	0.8780	3.050	3.051	23 52.3	1 35.5	32 46.4	2 11.1	1.33758	1.29892	4.68	0.6697
	18	0.8814	3.065	3.059	23 48.1	1 35.2	31 47.9	2 07.2	1.33950	1.29952	4.56	0.6586
	19	0.8841	3.070	3.068	23 42.0	1 34.8	30 49.5	2 03.3	1.34116	1.30011	4.44	0.6470
	20	0.8868	3.091	3.077	23 34.9	1 34.3	29 51.2	1 59.4	1.34249	1.30069	4.32	0.6350
h (1.0)	21	0.8896	+ 3.101	+ 3.086	23 28.2	1 33.9	28 53.0	1 55.5	+1.34348	+1.30125	+ 4.20	+ 0.6225
	22	0.8923	3.108	3.095	23 23.1	1 33.5	27 55.0	1 51.7	1.34419	1.30180	4.07	0.6095
	23	0.8951	3.113	3.104	23 20.4	1 33.4	26 57.2	1 47.8	1.34474	1.30235	3.95	0.5960
	24	0.8978	3.117	3.113	23 20.5	1 33.4	25 59.4	1 44.0	1.34526	1.30288	3.82	0.5818
	25	0.9005	3.120	3.122	23 23.2	1 33.5	25 01.8	1 40.1	1.34591	1.30340	3.69	0.5671
	26	0.9033	+ 3.125	+ 3.131	23 27.7	1 33.8	24 04.2	1 36.3	+1.34681	+1.30390	+ 3.56	+ 0.5517
	27	0.9060	3.132	3.141	23 32.9	1 34.2	23 06.8	1 32.5	1.34802	1.30438	3.43	0.5356
	28	0.9087	3.141	3.150	23 37.5	1 34.5	22 09.5	1 28.6	1.34953	1.30486	3.30	0.5187
	29	0.9115	3.152	3.159	23 40.3	1 34.7	21 12.3	1 24.8	1.35127	1.30531	3.17	0.5010
	30	0.9142	3.166	3.169	23 40.6	1 34.7	20 15.2	1 21.0	1.35312	1.30574	3.04	0.4823
Dec	1	0.9170	+ 3.180	+ 3.179	23 38.0	1 34.5	19 18.2	1 17.2	+1.35494	+1.30617	+ 2.91	+ 0.4627
	2	0.9197	3.194	3.188	23 32.9	1 34.2	18 21.2	1 13.4	1.35659	1.30657	2.77	0.4420
	3	0.9224	3.207	3.198	23 26.0	1 33.7	17 24.4	1 09.6	1.35796	1.30696	2.63	0.4201
	4	0.9252	3.218	3.208	23 18.5	1 33.2	16 27.6	1 05.8	1.35903	1.30733	2.49	0.3969
h (5.0)	5	0.9279	3.226	3.218	23 11.7	1 32.8	15 31.0	1 02.1	1.35980	1.30768	2.36	0.3723
	6	0.9307	+ 3.233	+ 3.228	23 06.6	1 32.4	14 34.4	0 58.3	+1.36037	+1.30801	+ 2.22	+ 0.3460
	7	0.9334	3.238	3.238	23 03.9	1 32.3	13 37.8	0 54.5	1.36086	1.30832	2.08	0.3179
	8	0.9361	3.242	3.248	23 03.6	1 32.2	12 41.3	0 50.8	1.36143	1.30862	1.94	0.2877
	9	0.9389	3.247	3.258	23 05.5	1 32.4	11 45.0	0 47.0	1.36221	1.30890	1.80	0.2550
	10	0.9416	3.254	3.269	23 08.7	1 32.6	10 48.6	0 43.2	1.36329	1.30915	1.66	0.2195
	11	0.9443	+ 3.263	+ 3.279	23 12.0	1 32.8	9 52.3	0 39.5	+1.36471	+1.30939	+ 1.52	+ 0.1808
	12	0.9471	3.275	3.289	23 14.1	1 32.9	8 56.0	0 35.7	1.36643	1.30961	1.37	0.1380
	13	0.9498	3.290	3.299	23 14.1	1 32.9	7 59.7	0 32.0	1.36836	1.30980	1.23	0.0904
	14	0.9526	3.306	3.309	23 11.5	1 32.8	7 03.5	0 28.2	1.37037	1.30998	1.09	0.0368
	15	0.9553	3.323	3.320	23 06.1	1 32.4	6 07.4	0 24.5	1.37231	1.31013	0.94	9.9754
	16	0.9580	+ 3.339	+ 3.330	22 58.5	1 31.9	5 11.3	0 20.8	+1.37403	+1.31026	+ 0.80	+ 9.9039
	17	0.9608	3.354	3.341	22 49.8	1 31.3	4 15.2	0 17.0	1.37544	1.31036	0.66	9.8179
	18	0.9635	3.366	3.351	22 40.9	1 30.7	3 19.2	0 13.3	1.37653	1.31045	0.51	9.7104
	19	0.9662	3.375	3.361	22 33.0	1 30.2	2 23.1	0 09.5	1.37733	1.31052	0.37	9.5670
h (6.0)	20	0.9690	3.382	3.371	22 27.2	1 29.8	1 27.0	0 05.8	1.37792	1.31056	0.22	9.3510
	21	0.9717	+ 3.388	+ 3.382	22 23.9	1 29.6	0 31.0	0 02.1	+1.37843	+1.31059	+ 0.08	+ 8.9019
	22	0.9745	3.392	3.392	22 23.1	1 29.5	359 34.0	23 58.3	1.37902	1.31059	0.06	- 8.8122
	23	0.9772	3.398	3.403	22 24.4	1 29.6	358 38.8	23 54.6	1.37978	1.31057	0.21	9.3214
	24	0.9799	3.405	3.413	22 26.7	1 29.8	357 42.7	23 50.8	1.38079	1.31052	0.35	9.5403
	25	0.9827	3.414	3.423	22 28.9	1 29.9	356 46.5	23 47.1	1.38208	1.31045	0.50	9.6979
	26	0.9854	+ 3.426	+ 3.434	22 29.7	1 30.0	355 50.4	23 43.4	+1.38361	+1.31038	- 1.04	9.8083
	27	0.9881	3.440	3.445	22 28.4	1 29.9	354 54.2	23 39.6	1.38528	1.31027	0.79	9.8961
	28	0.9909	3.454	3.455	22 24.5	1 29.6	353 58.1	23 35.9	1.38695	1.31013	0.93	9.9690
	29	0.9936	3.468	3.465	22 18.1	1 29.2	353 01.9	23 32.1	1.38850	1.30998	1.07	0.0313
	30	0.9964	3.483	3.475	22 09.9	1 28.7	352 05.6	23 28.4	1.38980	1.30982	1.22	0.0857
	31	0.9991	+ 3.495	+ 3.485	22 00.8	1 28.1	351 09.2	23 24.6	+1.39084	+1.30963	1.36	0.1339
	32	1.0018	+ 3.505	+ 3.495	21 51.8	1 27.4	350 12.8	23 20.9	+1.39157	+1.30940	1.50	0.1771

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (HEV.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	1 23	+88 47	Feb.	6 55	+87 12	Feb.	18 03	+86 36	Feb.	19 18	+88 59
	s	″		s	″		s	″		s	″
1.2	33.91	26.2	1.4	14.79	10.8	1.9	30.30	43.2	1.9	50.38	31.9
2.2	33.06	26.1	2.4	14.64	11.1	2.9	30.50	42.9	2.9	50.70	31.6
3.2	32.18	26.0	3.4	14.49	11.3	3.9	30.70	42.7	3.9	51.01	31.4
4.2	31.28	26.0	4.4	14.35	11.6	4.9	30.90	42.4	4.9	51.31	31.1
5.2	30.33	25.9	5.4	14.21	11.9	5.9	31.11	42.1	5.9	51.65	30.8
6.2	29.30	25.8	6.4	14.05	12.2	6.9	31.34	41.8	6.9	52.04	30.4
7.2	28.26	25.7	7.4	13 85	12.5	7.9	31.59	41.6	7.9	52.51	30.1
8.2	27.19	25.6	8.4	13.64	12.8	8.9	31.88	41.3	8.9	53.05	29.8
9.2	26.15	25.4	9.4	13.40	13.1	9.9	32.18	41.0	9.9	53.68	29.4
10.2	25.16	25.3	10.4	13.13	13.4	10.9	32.48	40.8	10.9	54.36	29.1
11.2	24.23	25.1	11.4	12.84	13.7	11.9	32.79	40.6	11.9	55.07	28.8
12.2	23.36	24.9	12.4	12.55	13.9	12.9	33.09	40.4	12.9	55.78	28.6
13.2	22.57	24.7	13.4	12.28	14.2	13.9	33.38	40.2	13.9	56.47	28.3
14.2	21.82	24.6	14.4	12.01	14.4	14.9	33.65	40.1	14.9	57.13	28.1
15.1	21.08	24.4	15.4	11.75	14.6	15.9	33.90	39.9	15.9	57.74	27.9
16.1	20.36	24.2	16.4	11.52	14.8	16.8	34.16	39.7	16.9	58.32	27.6
17.1	19.61	24.1	17.4	11.29	15.0	17.8	34.41	39.5	17.9	58.87	27.4
18.1	18.81	24.0	18.4	11.06	15.3	18.8	34.69	39.3	18.9	59.44	27.1
19.1	17.96	23.8	19.4	10.82	15.5	19.8	34.96	39.1	19.9	60.07	26.8
20.1	17.08	23.6	20.4	10.55	15.8	20.8	35.26	38.9	20.9	60.76	26.6
21.1	16.17	23.5	21.4	10.26	16.0	21.8	35.59	38.7	21.9	61.52	26.3
22.1	15.26	23.2	22.4	9.94	16.3	22.8	35.94	38.5	22.9	62.38	26.0
23.1	14.38	23.0	23.4	9.58	16.5	23.8	36.30	38.3	23.9	63.30	25.7
24.1	13.56	22.8	24.3	9.21	16.8	24.8	36.68	38.2	24.9	64.28	25.4
25.1	12.79	22.5	25.3	8.82	17.0	25.8	37.04	38.0	25.9	65.31	25.2
26.1	12.10	22.3	26.3	8.44	17.1	26.8	37.41	37.9	26.9	66.31	25.0
27.1	11.44	22.0	27.3	8.06	17.3	27.8	37.76	37.8	27.9	67.29	24.8
28.1	10.87	21.8	28.3	7.69	17.4	28.8	38.10	37.7	28.9	68.23	24 7
29.1	10.31	21.5	29.3	7.34	17.6	29.8	38.43	37.6	29.9	69.13	24.5

MEAN PLACES FOR 1902.0. (January 0.584^d, Washington.)					
Name of Star.	Magni-tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
33 Piscium . . .	4.7	0 00 19.182	+ 3.0716	− 6 15 20.82	+ 20.137
α Andromedæ . .	2.1	0 03 19.217	3.0936	+ 28 32 57.77	19.882
β Cassiopeiæ . . .	2.4	0 03 56.697	3.1780	+ 58 36 33.35	19.863
22 Andromedæ . .	4.9	0 05 13.499	3.1055	+ 45 31 36.91	20.037
γ Pegasi (*Algenib*) .	2.8	0 08 11.305	3.0851	+ 14 38 19.52	20.024
σ Andromedæ . .	4.4	0 13 12.357	+ 3.1244	+ 36 14 30.87	+ 19.967
ι Ceti	3.6	0 14 26.102	3.0572	− 9 22 01.79	19.977
44 Piscium . . .	5.8	0 20 22.724	3.0739	+ 1 23 49.08	19.944
β Hydri	2.8	0 20 36.503	3.2191	− 77 48 22.29	20.284
12 Ceti	6.0	0 25 02.264	3.0620	− 4 29 55.48	19.927
π Andromedæ . .	4.4	0 31 38.674	+ 3.1946	+ 33 10 47.70	+ 19.856
α Cassiopeiæ (*var.*) .	2.3	0 34 56.515	3.3796	+ 55 59 59.77	19.782
β Ceti	2.2	0 38 40.252	3.0132	− 18 31 27.81	19.804
21 Cassiopeiæ . . .	5.7	0 39 10.057	3.8844	+ 74 27 08.84	19.728
υ Cassiopeiæ . .	4.7	0 39 15.680	3.3260	+ 47 44 53.19	19.747
δ Piscium . . .	4.8	0 43 35.826	+ 3.1091	+ 7 03 06.47	+ 19.641
γ Cassiopeiæ . . .	2.3	0 50 47.322	3.5885	+ 60 11 10.10	19.551
μ Andromedæ . .	4.0	0 51 18.669	3.3171	+ 37 58 04.29	19.576
43 Cephei (H.) . .	4.6	0 55 16.28*	7.4206	+ 85 43 53.67	19.463
ε Piscium . . .	4.3	0 57 51.369	3.1101	+ 7 21 45.33	19.437
β Andromedæ . .	2.2	1 04 14.524	+ 3.3470	+ 35 06 03.81	+ 19.147
κ Tucanæ . . .	4.9	1 12 26.701	2.0419	− 69 23 48.29	19.143
f Piscium . . .	5.1	1 12 44.605	3.0916	+ 3 05 54.52	19.020
θ¹ Ceti . . .	3.6	1 19 07.479	2.9975	− 8 41 20.24	18.649
α Ursæ Minoris (*Polaris*)	2.2	1 23 24.04*	25.6285	+ 88 47 04.11	18.737
38 Cassiopeiæ . . .	5.9	1 23 55.702	+ 4.3965	+ 69 45 37.53	+ 18.646
η Piscium . . .	3.7	1 26 14.260	3.2040	+ 14 50 26.65	18.641
υ Andromedæ . .	4.2	1 31 02.528	3.5052	+ 40 54 55.47	18.109
π Piscium . . .	5.5	1 31 54.113	3.1749	+ 11 38 25.20	18.491
α Eridani (*Achernar*) .	0.4	1 34 03.895	2.2381	− 57 44 04.63	18.341
ν Piscium . . .	4.6	1 36 19.828	+ 3.1185	+ 4 59 30.59	+ 18.305
ο Piscium . . .	4.4	1 40 13.050	3.1635	+ 8 39 52.60	18.205
ζ Ceti	3.6	1 46 37.384	2.9598	− 10 49 08.54	17.889
β Arietis . . .	2.8	1 49 13.447	3.3059	+ 20 19 44.77	17.702
50 Cassiopeiæ . . .	4.1	1 55 03.269	5.0362	+ 71 56 50.01	17.593
γ Andromedæ . .	2.2	1 57 52.827	+ 3.6661	+ 41 51 34.73	+ 17.402
α Arietis . . .	2.1	2 01 38.804	3.3734	+ 22 59 57.11	17.145
β Trianguli . . .	3.1	2 03 42.568	3.5575	+ 34 31 26.01	17.152
ξ¹ Ceti . . .	4.5	2 07 48.266	3.1754	+ 8 23 13.47	16.994
γ Trianguli . . .	4.3	2 11 29.138	3.5546	+ 33 23 38.78	16.785
67 Ceti . . .	5.6	2 12 05.678	+ 2.9900	− 6 52 25.22	+ 16.698
δ Hydri . . .	4.2	2 20 00.166	1.0546	− 69 06 18.99	16.441
ι Cassiopeiæ . . .	4.6	2 20 59.075	4.8857	+ 66 57 43.24	16.382
ξ² Ceti . . .	4.5	2 22 56.831	+ 3.1849	+ 8 01 15.53	16.265
μ Hydri	5.3	2 33 44.190	− 1.3833	− 79 32 13.22	15.666
δ Ceti	4.1	2 34 27.517	+ 3.0721	·· 0 05 38.45	+ 15.668
θ Persei . . .	4.2	2 37 30.153	4.0766	+ 48 48 51.06	15.409
γ Ceti	3.6	2 38 13.295	+ 3.1047	+ 2 49 22.71	+ 15.306

MEAN PLACES FOR 1902.0.   (January 0.584^d, Wash'ngton.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ' "	"
σ Arietis . . .	5.5	2 46 04.820	+ 3.3061	+ 14 40 42.05	+ 14.975
47 Cephei (H.) . .	5.7	2 53 02.268	7.7880	+ 79 01 54.27	14.609
ε Arietis . . .	4.6	2 53 36.370	3.4230	+ 20 56 54.74	14.555
a Ceti . . .	2.6	2 57 09.333	3.1319	+ 3 42 19.59	14.272
β Persei (*Algol*) (*var.*) .	2.3	3 01 47.352	3.8888	+ 40 34 41.95	14.062
48 Cephei (H.) . .	5.5	3 07 52.147	+ 7.4542	+ 77 22 29.95	+ 13.625
ζ Arietis . . .	4.8	3 09 15.990	3.4414	+ 20 40 53.05	13.509
a Persei. . .	1.9	3 17 19.340	+ 4.2628	+ 49 30 45.44	13.036
ι Hydri. . .	5.7	3 18 23.495	− 1.5784	− 77 44 47.37	13.034
f Tauri . . .	4.3	3 25 27.679	+ 3.3073	+ 12 36 03.76	12.518
ε Eridani . .	3.7	3 28 18.768	+ 2.8245	− 9 47 23.03	+ 12.346
δ Persei. . .	3.1	3 35 56.639	4.2546	+ 47 28 27.98	11.751
γ Camelopardalis . .	4.6	3 40 00.332	6.2633	+ 71 01 49.77	11.441
η Tauri . . .	3.1	3 41 39.433	3.5593	+ 23 48 08.26	11.330
ζ Persei. . .	3.0	3 47 58.171	+ 3.7627	+ 31 35 34.16	10.906
γ Hydri . . .	3.3	3 48 45.081	− 0.9791	− 74 32 21.77	+ 10.980
ε Persei. . .	3.0	3 51 16.521	+ 4.0155	+ 39 43 37.04	10.650
γ Eridani . .	3.0	3 53 27.417	2.7979	− 13 47 13.59	10.404
A¹ Tauri . . .	4.6	3 58 54.002	3.5413	+ 21 48 51.74	10.049
c Persei. . .	4.3	4 01 32.668	4.3424	+ 47 27 03.90	9.874
o¹ Eridani . .	4.2	4 07 04.884	+ 2.9265	− 7 05 34.35	+ 9.568
γ Tauri . . .	3.8	4 14 12.913	3.4101	+ 15 23 28.29	8.902
ε Tauri . . .	3.6	4 22 53.585	+ 3.4992	+ 18 57 47.84	8.208
δ Mensæ . .	5.6	4 24 35.426	− 4.1839	− 80 26 37.10	8.178
m Persei . . .	6.0	4 26 31.051	+ 4.2118	+ 42 51 17.29	7.956
a Tauri (*Aldebaran*) .	1.0	4 30 17.767	+ 3.4386	+ 16 18 44.96	+ 7.458
τ Tauri . . .	4.5	4 36 21.723	3.5971	+ 22 46 08.87	7.135
a Camelopardalis . .	4.4	4 44 18.270	5.9394	+ 66 10 35.60	6.506
i Tauri . . .	5.2	4 45 38.404	3.5063	+ 18 40 23.82	6.356
ι Aurigæ . .	2.8	4 50 36.610	3.9020	+ 33 00 40.17	5.956
ζ Aurigæ . .	3.9	4 55 37.573	+ 4.1873	+ 40 55 59.07	+ 5.535
11 Orionis . .	4.7	4 58 58.110	3.4256	+ 15 16 04.25	5.240
β Eridani . .	2.9	5 03 01.913	2.9486	− 5 12 46.42	4.858
a Aurigæ (*Capella*) .	0.1	5 09 26.888	4.4267	+ 45 53 55.02	3.957
β Orionis (*Rigel*) . .	0.3	5 09 49.660	2.8818	− 8 18 52.68	4.354
τ Orionis . .	3.8	5 12 50.867	+ 2.9120	− 6 57 00.36	+ 4.091
β Tauri . . .	1.8	5 20 05.772	3.7903	+ 28 31 29.69	3.296
χ Aurigæ . .	5.0	5 26 20.918	3.9030	+ 32 07 11.16	2.920
Groombridge 966 .	6.4	5 26 36.988	7.9999	+ 74 58 45.83	2.927
δ Orionis (*var.*) .	2.3	5 26 59.976	3.0638	− 0 22 17.30	2.874
a Leporis . .	2.7	5 28 24.474	+ 2.6453	− 17 53 32.13	+ 2.754
Groombridge 944 .	6.4	5 30 31.733	18.7011	+ 85 08 54.79	2.567
ε Orionis . .	1.8	5 31 14.425	3.0431	− 1 15 51.36	2.510
a Columbæ . .	2.7	5 36 06.024	2.1721	− 34 07 34.37	2.048
κ Orionis . .	2.3	5 43 06.515	2.8445	− 9 42 15.29	1.473
δ Doradus . .	4.4	5 44 35.787	+ 0.1011	− 65 46 20.17	+ 1.345
ν Aurigæ . .	4.1	5 44 41.842	4.1567	+ 39 07 12.10	1.351
a Orionis (*var.*) .	0.9	5 49 51.967	+ 3.2475	+ 7 23 20.42	+ 0.896

MEAN PLACES FOR 1902.0. (January 0.584ᵈ, Washington.)					
Name of Star.	Magni-tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
β Aurigæ . . .	2.0	5 52 20.440	+ 4.4014	+ 44 56 15.98	+ 0.664
θ Aurigæ . . .	2.9	5 53 02.312	4.0913	+ 37 12 21.46	+ 0.518
ν Orionis . . .	4.5	6 01 58.615	3.4262	+ 14 46 49.32	− 0.198
22 Camelopardalis (H.) .	4.7	6 08 02.939	6.6199	+ 69 21 16.81	0.818
η Geminorum . .	3.5	6 08 57.758	3.6226	+ 22 32 07.51	0.800
μ Geminorum . .	3.2	6 17 01.925	+ 3.6308	+ 22 33 50.94	− 1.603
ψ¹ Aurigæ . . .	5.1	6 17 21.144	4.6266	+ 49 20 17.57	1.520
a Argûs (Canopus) . .	−0.8	6 21 46.588	1.3318	− 52 38 31.43	1.893
ν Geminorum . .	4.2	6 23 08.660	3.5631	+ 20 16 27.89	2.037
γ Geminorum . .	2.0	6 32 03.057	3.4673	+ 16 28 59.27	2.842
ε Geminorum . .	3.2	6 37 54.194	+ 3.6933	+ 25 13 42.32	− 3.318
ψ⁵ Aurigæ . . .	5.4	6 39 40.665	4.3311	+ 43 40 30.80	3.293
† a Canis Majoris (Sirius) .	−1.4	6 40 49.781	2.6435	− 16 34 53.57	4.760
θ Geminorum . .	3.7	6 46 19.866	+ 3.9592	+ 34 04 46.78	4.075
ζ Mensæ . . .	5.6	6 48 12.546	− 4.9219	− 80 42 37.39	4.104
51 Cephei (H.) . .	5.3	6 54 43.23*	+29.5952	+ 87 12 11.06	− 4.770
ε Canis Majoris : .	1.5	6 54 46.457	2.3573	− 28 50 18.58	4.743
ζ Geminorum (var.) .	4.0	6 58 17.834	3.5613	+ 20 42 51.39	5.052
δ Canis Majoris .	1.9	7 04 24.360	2.4380	− 26 14 14.65	5.556
63 Aurigæ . . .	5.2	7 04 54.986	+ 4.1346	+ 39 28 50.42	5.605
γ² Volantis (var.) . .	3.9	7 09 34.771	− 0.4969	− 70 20 23.04	± 5.916
25 Camelopardalis (H.) .	5.3	7 10 29.472	+12.8945	+ 82 36 03.86	6.116
δ Geminorum . .	3.5	7 14 16.282	3.5875	+ 22 09 46.87	6.398
Piazzi vii, 67 .	5.7	7 20 41.316	6.2861	+ 68 39 58.22	6.958
β Canis Minoris .	3.1	7 21 50.214	3.2560	+ 8 29 13.23	7.054
a² Geminorum (Castor) .	1.9	7 28 20.893	+ 3.8350	+ 32 06 13.94	− 7.620
† a Canis Min. (Procyon) .	0.5	7 34 10.340	3.1428	+ 5 28 34.51	9.045
β Geminorum (Pollux) .	1.2	7 39 19.222	3.6774	+ 28 15 47.27	8.474
φ Geminorum . .	5.0	7 47 30.075	3.6783	+ 27 01 11.01	9.089
26 Lyncis . . .	5.8	7 47 34.787	4.3855	+ 47 49 08.12	9.074
Groombridge 1374 .	5.6	7 48 28.475	+ 7.2682	+ 74 10 48.17	− 9.175
ω¹ Cancri . . .	6.0	7 55 00.156	3.6356	+ 25 39 40.66	9.646
3 Ursæ Majoris (H.) .	5.5	8 03 03.963	6.0276	+ 68 45 46.46	10.250
15 Argûs (ρ) . .	3.1	8 03 22.218	2.5545	− 24 01 17.45	10.226
ζ¹ Cancri . . .	4.8	8 06 35.565	3.4459	. + 17 56 36.92	10.647
β Cancri . . .	3.8	8 11 12.074	+ 3.2566	+ 9 29 16.05	− 10.912
30 Monocerotis . .	3.9	8 20 45.871	+ 3.0000	− 3 35 11.44	11.573
θ Chamæleontis . .	4.6	8 23 35.192	− 1.7256	77 10 06.40	11.737
η Cancri . . .	5.4	8 27 02.582	+ 3.4761	+ 20 46 27.36	12.053
σ Hydræ . . .	4.5	8 33 38.165	3.1390	+ 3 41 08.60	12.407
γ Cancri . . .	4.9	8 37 36.990	+ 3.4787	+ 21 49 16.13	− 12.769
ε Hydræ . . .	3.5	8 41 35.238	3.1807	+ 6 46 42.95	13.041
σ² Cancri (mean) .	5.5	8 48 16.053	3.6708	+ 30 57 02.73	13.453
ι Ursæ Majoris . .	3.3	8 52 30.081	4.1285	+ 48 25 36.01	13.953
σ² Ursæ Majoris . .	5.0	9 01 46.701	5.3394	+ 67 31 57.40	14.351
κ Cancri . . .	5.1	9 02 26.426	+ 3.2539	+ 11 03 45.92	14.338
θ Hydræ . . .	4.0	9 09 16.001	3.1244	+ 2 43 40.62	15.048
β Argûs	2.0	9 12 07.585	+ 0.6746	− 69 18 48.59	− 14.812

† Periodic corrections given in the Appendix are still to be applied to the positions of Sirius and Procyon.

Name of Star.	Magni-tude.	Right Ascension.	Annual Variation.	Declination	Annual Variation.
		h m s	s	° ′ ″	″
ι Argûs	2.6.	9 14 27.928	+ 1.6043	− 58 51 49.88	− 15.035
a Lyncis . . .	3.3	9 15 05.230	3.6669	+ 34 48 25.76	15.065
a Hydræ . . .	2.1	9 22 46.320	2.9488	− 8 14 00.96	15.478
1 Draconis (H.) . .	4.5	9 23 09.073	8.9008	+ 81 45 35.81	15.560
d Ursæ Majoris . .	4.8	9 25 49.636	5.3820	+ 70 15 40.71	15.608
θ Ursæ Majoris . .	3.2	9 26 18.414	+ 4.0375	+ 52 07 27.24	− 16.250
10 Leonis Minoris . .	4.7	9 28 13.350	3.6890	+ 36 49 58.37	15.830
υ Leonis . . .	3.8	9 35 55.288	+ 3.2062	+ 10 20 18.26	16.247
ζ Chamæleontis . .	5.2	9 36 46.868	− 1.6122	− 80 30 03.40	16.240
ε Leonis . . .	3.2	9 40 17.414	+ 3.4133	+ 24 13 32.20	16.458
μ Leonis . . .	4.0	9 47 11.483	+ 3.4196	+ 26 28 07.24	− 16.829
19 Leonis Minoris . .	5.2	9 51 41.093	3.6897	+ 41 31 21.08	17.008
π Leonis . . .	5.0	9 55 02.130	3.1733	+ 8 30 52.45	17.166
a Leonis (*Regulus*) .	1.3	10 03 09.240	3.1995	+ 12 26 46.73	17.499
32 Ursæ Majoris . .	5.7	10 10 55.444	4.4081	+ 65 35 50.63	17.831
λ Ursæ Majoris . .	3.6	10 11 11.400	+ 3.6360	+ 43 24 14.24	− 17.868
γ¹ Leonis . . .	2.5	10 14 34.252	3.3135	+ 20 20 14.66	18.114
μ Hydræ . . .	4.1	10 21 21.032	2.9000	− 16 20 09.02	18.297
β Leonis Minoris . .	4.3	10 22 13.166	3.4830	+ 37 12 34.07	18.362
a Antliæ . . .	4.5	10 22 39.987	2.7411	− 30 34 08.04	18.289
9 Draconis (H.) . .	5.0	10 26 46.759	+ 5.2197	+ 76 13 04.67	− 18.420
ρ Leonis . . .	4.0	10 27 39.128	3.1626	+ 9 48 39.79	18.445
41 Leonis Minoris . .	5.1	10 38 05.356	3.2692	+ 23 42 05.65	18.770
η Argûs (*var.*) . .	1–6	10 41 15.440	2.3179	-- 59 10 09.20	18.884
l Leonis . . .	5.3	10 44 06.433	3.1575	+ 11 03 49.68	18.991
δ² Chamæleontis . .	4.7	10 44 52.022	+ 0.6071	− 80 01 23.88	-- 18.983
46 Leonis Minoris . .	3.9	10 47 49.999	3.3668	+ 34 44 36.03	19.344
Groombridge 1706 .	6.3	10 52 07.666	4.9284	+ 78 17 42.91	19.209
a Ursæ Majoris . .	2.0	10 57 41.138	+ 3.7390	+ 62 16 48.57	19.381
η Octantis . . .	6.1	11 00 00.34*	− 0.3122	− 84 04 00.10	19.369
ρ³ Leonis . . .	6.2	11 01 54.324	+ 3.0616	+ 2 29 15.67	− 19.486
ψ Ursæ Majoris . .	3.2	11 04 09.431	3.3898	+ 45 01 49.24	19.487
δ Leonis . . .	2.7	11 08 53.884	3.1969	+ 21 03 38.48	19.691
ν Ursæ Majoris . .	3.7	11 13 11.259	3.2509	+ 33 37 44.89	19.604
δ Crateris . . .	3.9	11 14 26.420	2.9965	− 14 14 53.25	19.457
τ Leonis . . .	5.1	11 22 53.868	+ 3.0860	+ 3 23 45.76	− 19.801
λ Draconis . . .	4.0	11 25 35.594	3.6105	+ 69 52 19.26	19.842
ξ Hydræ . . .	3.8	11 28 10.825	2.9441	− 31 18 55.34	19.908
υ Leonis . . .	4.4	11 31 55.868	3.0715	− 0 16 57.42	19.858
χ Ursæ Majoris . .	3.9	11 40 52.719	3.1846	+ 48 19 22.13	19.957
β Leonis . . .	2.2	11 44 03.711	+ 3.0633	+ 15 07 11.70	− 20.117
γ Ursæ Majoris . .	2.4	11 48 40.768	3.1756	+ 54 14 22.75	20.018
π Virginis . . .	4.6	11 55 51.065	3.0745	+ 7 09 38.85	20.075
ο Virginis . . .	4.3	12 00 13.050	3.0574	+ 9 16 38.15	20.014
ε Corvi	3.2	12 05 05.000	3.0793	− 22 04 29.03	20.039
4 Draconis (H.) . .	5.1	12 07 36.837	+ 2.8632	+ 78 09 38.93	− 20.016
γ Corvi	2.7	12 10 45.889	3.0802	− 16 59 51.75	20.008
2 Canum Venaticorum .	6.0	12 11 13.096	+ 3.0190	+ 41 12 20.26	− 20.069

MEAN PLACES FOR 1902.0. (January 0.584^d, Washington.)					
Name of Star.	Magni-tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
β Chamæleontis . .	4.5	12 12 35.266	+ 3.4232	− 78 46 04.98	− 19.999
6 Ursæ Minoris (B) .	6.2	12 14 23.615	0.2630	+ 88 14 35.30	19.949
η Virginis . . .	4.0	12 14 53.530	3.0690	− 0 07 19.87	20.032
a^1 Crucis . . .	0.9	12 21 08.558	3.3031	− 62 33 21.47	20.001
δ^2 Corvi . . .	3.1	12 24 47.557	3.0996	− 15 58 11.38	20.078
β Canum Venaticorum .	4.4	12 29 05.476	+ 2.8589	+ 41 53 23.84	− 19.606
β Corvi	2.8	12 29 14.237	3.1433	− 22 51 17.30	19.945
κ Draconis . . .	3.8	12 29 18.217	2.5844	+ 70 19 42.28	19.873
γ Virginis (*mean*) .	2.9	12 36 41.696	3.0392	− 0 54 42.91	19.786
31 Comæ Berenices .	5.1	12 46 55.539	2.9252	+ 28 04 26.19	19.652
32^2 Camelopardalis (H) .	5.2	12 48 24.001	+ 0.4125	+ 83 56 44.22	− 19.585
a Canum Venaticorum .	3.2	12 51 26.685	2.8125	+ 38 50 51.30	19.495
δ Muscæ . . .	3.8	12 55 31.285	4.0540	− 71 01 12.95	19.493
ϵ Virginis . . .	3.1	12 57 17.916	2.9865	+ 11 29 08.96	19.409
θ Virginis . . .	4.6	13 04 52.493	3.1022	− 5 00 57.08	19.289
20 Canum Venaticorum .	4.7	13 13 09.003	+ 2.6973	+ 41 05 18.75	− 19.019
a Virginis (*Spica*) .	1.1	13 20 01.744	3.1555	− 10 38 59.34	18.869
κ Octantis . . .	5.4	13 24 59.75*	8.8683	− 85 17 02.16	18.707
ζ Virginis . . .	3.6	13 29 41.922	3.0537	− 0 05 41.60	18.491
B. A. C. 4536 . .	5.0	13 30 25.339	2.6829	+ 37 41 04.03	18.511
m Virginis . . .	5.4	13 36 28.031	+ 3.1438	− 8 12 30.81	− 18.264
η Ursæ Majoris . .	1.9	13 43 40.814	2.3692	+ 49 48 08.18	18.053
η Bootis . . .	2.8	13 50 01.117	2.8568	+ 18 53 19.91	18.144
θ Apodis (*var.*) .	5.0	13 55 45.848	5.7010	− 76 19 25.70	17.572
β Centauri . . .	0.7	13 56 54.216	4.1947	− 59 54 00.95	17.528
π Hydræ . . .	3.6	14 00 47.321	+ 3.4064	− 26 12 37.38	− 17.472
a Draconis . . .	3.7	14 01 44.191	1.6238	+ 64 50 38.97	17.273
d Bootis . . .	4.8	14 05 55.887	2.7402	+ 25 33 20.66	17.173
κ Virginis . . .	4.2	14 07 40.013	+ 3.1952	− 9 49 03.61	16.884
4 Ursæ Minoris . .	4.9	14 09 13.398	− 0.3010	+ 78 00 28.66	16.918
δ Octantis . . .	5.0	14 11 09.971	+ 9.1090	− 83 13 08.86	− 16.866
a Bootis (*Arcturus*) .	0.2	14 11 11.470	2.7352	+ 19 41 32.95	18.853
λ Bootis . . .	4.3	14 12 39.555	2.2838	+ 46 32 17.51	16.630
λ Virginis . . .	4.7	14 13 48.312	3.2390	− 12 55 12.43	16.705
θ Bootis . . .	4.1	14 21 51.679	2.0434	+ 52 18 12.98	16.732
ρ Bootis . . .	3.6	14 27 36.409	+ 2.5867	+ 30 48 05.22	− 15.917
5 Ursæ Minoris . .	4.5	14 27 43.516	− 0.1779	+ 76 07 54.19	16.003
a^2 Centauri . . .	0.2	14 32 56.293	+ 4.0451	− 60 25 51.81	15.018
33 Bootis . . .	5.3	14 35 11.455	2.2344	+ 44 49 38.30	15.667
a Apodis . . .	4.1	14 35 39.905	7.2381	− 78 37 43.91	15.621
ϵ Bootis . . .	2.6	14 40 42.430	+ 2.6203	+ 27 29 13.90	− 15.307
a^2 Libræ . . .	2.9	14 45 27.314	+ 3.3118	− 15 38 04.74	15.122
β Ursæ Minoris . .	2.2	14 50 59.212	− 0.2176	+ 74 33 21.61	14.719
β Bootis . . .	3.7	14 58 15.282	+ 2.2600	+ 40 46 37.02	14.323
γ Scorpii . . .	3.4	14 58 19.957	+ 3.5021	− 24 53 48.72	14.326
δ Bootis . . .	3.5	15 11 33.117	+ 2.4192	+ 33 40 48.81	− 13.568
β Libræ . . .	2.9	15 11 43.930	3.2233	− 9 01 17.30	13.455
ρ Octantis . . .	5.7	15 20 37.72*	+ 13.1527	− 84 08 20.60	− 12.765

MEAN PLACES FOR 1902.0. (January 0.584ᵈ, Washington.)					
Name of Star.	Magni-tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
μ¹ Bootis	4.5	15 20 47.301	+ 2.2662	+ 37 43 14.49	− 12.752
γ² Ursæ Minoris	3.2	15 20 52.856	− 0.1253	+ 72 10 57.70	12.814
β Coronæ Borealis	3.9	15 23 47.317	+ 2.4736	+ 29 26 36.05	12.552
α Coronæ Borealis	2.3	15 30 32.302	2.5391	+ 27 02 39.46	12.266
α Serpentis	2.7	15 39 26.411	2.9522	+ 6 44 01.53	11.496
ε Serpentis	3.7	15 45 55.805	+ 2.9875	+ 4 46 21.44	− 11.000
ζ Ursæ Minoris	4.6	15 47 32.910	− 2.2295	+ 78 05 46.00	10.955
ε Coronæ Borealis	4.1	15 53 31.777	+ 2.4819	+ 27 09 41.20	10.576
δ Scorpii	2.6	15 54 32.210	3.5402	− 22 20 34.66	10.469
β¹ Scorpii	2.9	15 59 44.199	3.4817	− 19 32 14.43	10.071
φ Herculis	4.2	16 05 40.921	+ 1.8892	+ 45 11 30.15	− 9.553
δ¹ Apodis	4.9	16 05 41.197	8.8097	− 78 26 57.02	9.645
Groombridge 2320	5.5	16 06 03.212	0.1476	+ 68 04 05.61	9.509
δ Ophiuchi	2.8	16 09 12.541	3.1404	− 3 26 31.74	9.462
σ Coronæ Borealis	5.3	16 11 00.504	2.2454	+ 34 06 24.81	9.249
τ Herculis	3.9	16 16 47.713	+ 1.8025	+ 46 32 47.62	− 8.696
γ Apodis	4.0	16 18 24.351	+ 9.0609	− 78 40 38.57	8.680
η Ursæ Minoris	5.0	16 20 21.691	− 1.8052	+ 75 58 52.67	8.191
η Draconis	2.8	16 22 39.788	+ 0.8055	+ 61 44 09.37	8.202
α Scorpii (Antares)	1.2	16 23 23.823	3.6722	− 26 12 52.86	8.230
β Herculis	2.8	16 26 00.373	+ 2.5770	+ 21 42 10.38	− 8.018
A Draconis	5.0	16 28 10.303	− 0.1349	+ 68 58 48.60	7.783
ζ Ophiuchi	2.8	16 31 45.689	+ 3.2997	− 10 22 07.57	7.507
α Trianguli Australis	2.2	16 38 16.975	6.3121	− 68 50 52.74	7.047
η Herculis	3.7	16 39 32.150	2.0553	+ 39 06 30.26	6.988
κ Ophiuchi	3.4	16 53 01.745	+ 2.8376	+ 9 31 37.74	− 5.786
ε Ursæ Minoris	4.5	16 55 59.617	− 6.2991	+ 82 11 56.64	5.527
d Herculis	5.3	16 57 59.238	+ 2.2116	+ 33 42 35.64	5.367
η Ophiuchi	2.5	17 04 45.394	3.4366	− 15 36 13.38	4.694
α¹ Herculis (var.)	3.2	17 10 10.716	2.7340	+ 14 30 06.43	4.294
π Herculis	3.4	17 11 37.992	+ 2.0880	+ 36 55 09.80	− 4.200
θ Ophiuchi	3.3	17 15 59.400	3.6808	− 24 54 06.80	3.862
b Ophiuchi (var.)	4.4	17 20 23.041	3.6599	− 24 05 07.49	3.585
δ Aræ	3.8	17 22 14.972	5.4025	− 60 36 08.82	3.407
β Draconis	3.0	17 28 13.083	1.3536	+ 52 22 25.67	2.762
α Ophiuchi	2.2	17 30 23.104	+ 2.7833	+ 12 37 51.96	− 2.818
ι Herculis	4.0	17 36 41.926	+ 1.6931	+ 46 03 30.01	2.032
ω Draconis	4.9	17 37 31.462	− 0.3556	+ 68 48 11.74	1.645
μ Herculis	3.5	17 42 37.370	+ 2.3466	+ 27 46 40.05	2.267
ψ¹ Draconis	4.8	17 43 40.788	− 1.0768	+ 72 11 49.27	1.694
θ Herculis	3.9	17 52 53.523	+ 2.0567	+ 37 15 47.84	− 0.617
γ Draconis	2.5	17 54 19.832	1.3921	+ 51 30 00.93	0.520
γ² Sagittarii	2.9	17 59 30.704	3.8517	− 30 25 31.58	− 0.241
υ Herculis	3.9	18 03 43.169	+ 2.3391	+ 28 44 55.66	+ 0.327
δ Ursæ Minoris	4.4	18 03 53.74*	− 19.4905	+ 86 36 48.54	0.388
μ Sagittarii	4.1	18 07 54.139	+ 3.5869	− 21 05 04.77	+ 0.689
η Serpentis	3.5	18 16 14.307	3.1026	− 2 55 27.87	0.728
λ Sagittarii	2.9	18 21 55.370	+ 3.7029	− 25 28 33.98	+ 1.716

MEAN PLACES FOR 1902.0.　(January 0.584ᵈ, Washington.)

Name of Star.	Magni-tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
χ Draconis	3.8	18 22 49.523	− 1.0775	+ 72 41 25.28	+ 1.619
1 Aquilæ	4.0	18 29 52.450	+ 3.2646	− 8 18 45.94	2.290
ζ Pavonis	4.2	18 31 35.098	7.0257	− 71 30 44.18	2.590
α Lyræ (*Vega*)	0.2	18 33 37.225	2.0313	+ 38 41 32.12	3.210
β Lyræ (*var.*)	3.6	18 46 27.699	2.2145	+ 33 14 55.29	4.031
σ Sagittarii	2.3	18 49 11.309	+ 3.7208	− 26 25 07.17	+ 4.195
50 Draconis	5.6	18 49 32.338	− 1.9129	+ 75 19 06.16	4.351
γ Lyræ	3.3	18 55 16.647	+ 2.2433	+ 32 33 17.64	4.783
ζ Aquilæ	3.1	19 00 54.345	2.7568	+ 13 43 03.20	5.166
σ Octantis	5.6	19 03 07.29*	101.6399	− 89 15 05.83	5.449
ι Lyræ	5.2	19 03 48.302	+ 2.1411	+ 35 56 46.38	+ 5.503
d Sagittarii	5.0	19 11 54.089	3.5118	− 19 07 38.97	6.170
δ Draconis	3.1	19 12 32.060	0.0254	+ 67 29 20.94	6.327
θ Lyræ	4.4	19 12 57.976	+ 2.0807	+ 37 57 32.65	6.281
τ Draconis	4.5	19 17 26.522	− 1.1279	+ 73 10 25.21	6.756
λ Ursæ Minoris	6.5	19 20 13.40*	−68.3558	+ 88 59 29.76	+ 6.883
δ Aquilæ	3.5	19 20 33.443	+ 3.0252	+ 2 55 09.00	6.983
β Cygni	3.1	19 26 46.143	2.4188	+ 27 45 13.04	7.400
κ Aquilæ	5.0	19 31 37.202	3.2294	− 7 14 43.68	7.804
β Sagittæ	4.5	19 36 38.835	2.6939	+ 17 14 55.67	8.174
γ Aquilæ	2.8	19 41 36.037	+ 2.8521	+ 10 22 27.13	+ 8.596
δ Cygni	2.9	19 41 54.757	1.8760	+ 44 53 28.95	8.667
α Aquilæ (*Altair*)	0.9	19 46 00.116	+ 2.9274	+ 8 36 33.32	9.323
ε Draconis	3.9	19 48 30.528	− 0.1819	+ 70 01 05.92	9.167
ε Pavonis	4.1	19 49 15.762	+ 7.0088	− 73 10 08.87	9.079
β Aquilæ	3.9	19 50 29.972	+ 2.9470	+ 6 09 42.44	+ 8.814
γ Sagittæ	3.6	19 54 23.922	2.6673	+ 19 13 32.76	9.621
c Sagittarii	4.5	19 56 38.001	3.6948	− 27 58 56.88	9.781
τ Aquilæ	5.7	19 59 21.172	2.9310	+ 7 00 04.90	10.004
θ Aquilæ	3.3	20 06 14.928	3.0965	− 1 06 44.38	10.498
31 Cygni	3.9	20 10 32.780	+ 1.8901	+ 46 26 38.21	+ 10.816
κ Cephei (*pr.*)	4.4	20 12 11.871	− 1.9434	+ 77 24 59.08	10.958
α² Capricorni	3.7	20 12 37.082	+ 3.3315	− 12 50 55.56	10.971
α Pavonis	2.1	20 17 53.824	4.7721	− 57 02 57.33	11.255
γ Cygni	2.3	20 18 42.660	2.1524	+ 39 56 34.09	11.406
π Capricorni	5.1	20 21 42.760	+ 3.4378	− 18 31 59.01	+ 11.618
ε Delphini	4.0	20 28 31.880	+ 2.86'6	+ 10 58 11.89	12.076
Groombridge 3241	6.5	20 30 26.047	− 0.2298	+ 72 11 58.80	12.215
α Delphini	3.9	20 35 05.186	+ 2.7868	+ 15 33 58.70	12.570
β Pavonis	3.4	20 36 07.937	5.4583	− 66 33 19.91	12.622
α Cygni	1.4	20 38 05.450	+ 2.0444	+ 44 55 47.82	+ 12.755
ψ Capricorni	4.3	20 40 17.688	3.5588	− 25 37 22.99	12.758
ε Cygni	2.6	20 42 14.759	2.4271	+ 33 36 10.76	13.362
μ Aquarii	4.8	20 47 22.133	+ 3.2388	− 9 21 04.58	13.334
12 Year Cat. 1879	5.3	20 52 02.882	− 2.5868	+ 80 11 05.92	13.650
ν Cygni	4.1	20 53 31.159	+ 2.2351	+ 40 47 22.65	+ 13.751
61¹ Cygni	5.4	21 02 30.190	2.6847	+ 38 16 02.19	17.573
ζ Cygni	3.3	21 08 45.898	+ 2.5515	+ 29 49 29.07	+ 14.646

Name of Star.	Magni-tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
τ Cygni . . .	3.8	21 10 52.730	+ 2.3934	+ 37 37 36.88	+ 15.265
α Cephei . . .	2.6	21 16 14.493	1.4358	+ 62 10 12.89	15.193
ι Pegasi . . .	4.3	21 17 33.255	2.7738	+ 19 23 06.18	15.282
ζ Capricorni . .	3.8	21 21 04.424	3.4325	− 22 50 09.30	15.437
β Aquarii . . .	2.9	21 26 24.038	3.1608	− 6 00 08.93	15.700
β Cephei (*pr.*)	3.4	21 27 23.913	+ 0.7906	+ 70 07 49.60	+ 15.770
ξ Aquarii . . .	4.8	21 32 32.148	3.1967	− 8 17 37.82	16.015
·74 Cygni . . .	5.0	21 33 01.247	2.4024	+ 39 58 23.19	16.072
λ¹ Octantis . .	5.4	21 35 55.651	9.6728	− 83 10 10.93	16.202
ε Pegasi . . .	2.4	21 39 22.360	2.9462	+ 9 25 31.87	16.389
11 Cephei . . .	4.8	21 40 29.266	+ 0.8925	+ 70 51 36.35	+ 16.539
π² Cygni . . .	4.5	21 43 10.329	2.2134	+ 48 51 21.57	16.578
μ Capricorni . .	5.2	21 47 57.236	3.2745	− 14 00 47.87	16.811
16 Pegasi . . .	5.1	21 48 36.160	2.7277	+ 25 27 50.27	16.847
79 Draconis . .	6.6	21 51 38.425	0.7250	+ 73 14 18.95	16.999
α Aquarii . . .	3.0	22 00 45.061	+ 3.0826	− 0 47 45.73	+ 17.392
α Gruis . . .	1.9	22 02 03.533	3.7996	− 47 26 08.86	17.276
π² Pegasi . . .	4.3	22 05 38.064	2.6615	+ 32 41 49.90	17.584
θ Aquarii . . .	4.4	22 11 39.780	3.1682	− 8 16 16.80	17.830
υ Octantis . .	6.2	22 13 00.59*	12.7718	− 86 27 57.69	17.976
γ Aquarii . . .	4.0	22 16 35.695	+ 3.0996	− 1 52 52.27	+ 18.056
π Aquarii . . .	4.6	22 20 16.332	3.0641	+ 0 52 47.83	18.178
σ Aquarii . . .	4.9	22 25 27.727	3.1782	− 11 10 46.16	18.340
α Lacertæ . . .	3.9	22 27 15.193	2.4658	+ 49 46 42.67	18.441
η Aquarii . . .	4.2	22 30 19.253	3.0836	− 0 37 21.66	18.478
226 Cephei (B.) .	5.7	22 30 33.231	+ 1.0694	+ 75 43 16.87	+ 18.539
10 Lacertæ . .	5.0	22 34 51.781	2.6871	+ 38 32 24.27	18.668
β Octantis . .	4.4	22 36 03.670	6.4028	− 81 53 43.49	18.719
ζ Pegasi . . .	3.5	22 36 34.456	2.9911	+ 10 19 10.72	18.719
λ Pegasi . . .	4.1	22 41 48.586	2.8858	+ 23 02 59.39	18.882
ι Cephei . . .	3.6	22 46 11.407	+ 2.1251	+ 65 41 05.53	+ 18.890
λ Aquarii . . .	3.8	22 47 30.144	3.1317	− 8 06 04.16	19.087
α Pis. Austr. (*Fomalhaut*)	1.3	22 52 14.218	3.3237	− 30 08 30.21	19.005
ο Andromedæ .	3.8	22 57 24.613	2.7521	+ 41 47 57.18	19.294
α Pegasi (*Markab*) .	2.5	22 59 52.712	2.9856	+ 14 40 40.47	19.322
φ Aquarii . . .	4.3	23 09 14.839	+ 3.1077	− 6 34 38.61	+ 19.363
ο Cephei . . .	5.1	23 14 35.929	2.4463	+ 67 34 30.91	19.672
τ Pegasi . . .	4.6	23 15 47.108	2.9643	+ 23 12 13.83	19.663
θ Piscium . . .	4.3	23 22 59.790	3.0416	+ 5 50 26.50	19.745
λ Andromedæ . .	3.8	23 32 45.929	2.9245	+ 45 55 37.89	19.485
ι Piscium . . .	4.3	23 34 54.562	+ 3.0840	+ 5 05 42.37	+ 19.491
γ Cephei . . .	3.5	23 35 19.340	2.4288	+ 77 05 07.48	20.088
ι¹ Aquarii . . .	5.2	23 39 07.172	3.1157	− 18 49 15.32	19.958
δ Sculptoris . .	4.6	23 43 49.311	3.1298	− 28 40 20.86	19.864
γ¹ Octantis . .	5.2	23 46 21.931	3.6562	− 82 33 48.44	20.000
Groombridge 4163 .	6.6	23 50 03.341	+ 2.8680	+ 73 51 53.87	+ 20.023
ω Piscium . . .	4.2	23 54 16.709	+ 3.0789	+ 6 19 14.93	+ 19.933

JANUARY, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*). Right Ascension.	Declination *North*.	Mean Solar Date.	51 Cephei (Hev.). Right Ascension.	Declination *North*.	Mean Solar Date.	δ Ursæ Minoris. Right Ascension.	Declination *North*.	Mean Solar Date.	λ Ursæ Minoris. Right Ascension.	Declination *North*.
Jan.	h m 1 23	° ′ +88 47	Jan.	h m 6 55	° ′ +87 12	Jan.	h m 18 03	° ′ +86 36	Jan.	h m 19 18	° ′ +88 59
	s	″		s	″		s	″		s	″
0.3	65.51	25.8	0.5	15.59	1.0	0.9	26.50	53.0	1.0	50.76	42.1
1.3	64.52	25.9	1.5	15.65	1.3	1.9	26.55	52.7	2.0	50.49	41.8
2.3	63.56	26.0	2.5	15.72	1.6	2.9	26.61	52.4	3.0	50.23	41.5
3.3	62.66	26.0	3.5	15.78	1.9	3.9	26.65	52.1	4.0	49.97	41.2
4.3	61.80	26.1	4.5	15.85	2.1	4.9	26.67	51.8	5.0	49.68	40.9
5.3	60.93	26.2	5.5	15.93	2.4	5.9	26.70	51.5	6.0	49.35	40.6
6.3	60.07	26.3	6.5	16.02	2.7	6.9	26.70	51.2	7.0	48.99	40.3
7.3	59.15	26.4	7.5	16.12	3.0	7.9	26.71	50.8	8.0	48.61	40.0
8.3	58.19	26.5	8.5	16.23	3.3	8.9	26.74	50.5	9.0	48.25	39.7
9.3	57.15	26.6	9.5	16.32	3.6	9.9	26.79	50.1	10.0	47.94	39.4
10.2	56.07	26.7	10.5	16.38	4.0	10.9	26.85	49.8	11.0	47.69	39.0
11.2	54.96	26.8	11.5	16.40	4.4	11.9	26.94	49.4	12.0	47.51	38.6
12.2	53.83	26.8	12.5	16.42	4.7	12.9	27.06	49.0	13.0	47.43	38.3
13.2	52.71	26.8	13.5	16.39	5.1	13.9	27.19	48.7	13.9	47.42	37.9
14.2	51.64	26.8	14.5	16.35	5.4	14.9	27.32	48.4	14.9	47.45	37.6
15.2	50.61	26.8	15.5	16.32	5.7	15.9	27.46	48.1	15.9	47.51	37.3
16.2	49.65	26.8	16.5	16.26	6.0	16.9	27.58	47.8	16.9	47.56	37.0
17.2	48.73	26.8	17.5	16.21	6.3	17.9	27.70	47.5	17.9	47.59	36.7
18.2	47.85	26.8	18.5	16.18	6.6	18.9	27.82	47.2	18.9	47.58	36.4
19.2	46.97	26.8	19.5	16.17	6.9	19.9	27.92	47.0	19.9	47.54	36.1
20.2	46.06	26.8	20.4	16.16	7.1	20.9	28.01	46.7	20.9	47.47	35.8
21.2	45.13	26.9	21.4	16.15	7.4	21.9	28.12	46.3	21.9	47.39	35.5
22.2	44.13	26.9	22.4	16.14	7.8	22.9	28.23	46.0	22.9	47.36	35.1
23.2	43.07	26.9	23.4	16.10	8.1	23.9	28.37	45.7	23.9	47.39	34.8
24.2	41.98	26.9	24.4	16.04	8.4	24.9	28.54	45.4	24.9	47.49	34.4
25.2	40.85	26.8	25.4	15.96	8.8	25.9	28.74	45.0	25.9	47.68	34.1
26.2	39.73	26.8	26.4	15.84	9.1	26.9	28.94	44.7	26.9	47.98	33.7
27.2	38.63	26.7	27.4	15.68	9.4	27.9	29.18	44.4	27.9	48.34	33.4
28.2	37.58	26.6	28.4	15.51	9.7	28.9	29.41	44.1	28.9	48.75	33.1
29.2	36.59	26.5	29.4	15.32	10.0	29.9	29.65	43.9	29.9	49.18	32.8
30.2	35.66	26.4	30.4	15.13	10.3	30.9	29.88	43.6	30.9	49.61	32.5
31.2	34.77	26.3	31.4	14.95	10.6	31.9	30.10	43.4	31.9	50.02	32.2
32.2	33.91	26.2	32.4	14.79	10.8	32.9	30.30	43.2	32.9	50.38	31.9

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	1 23	+88 47	Feb.	6 55	+87 12	Feb.	18 03	+86 36	Feb.	19 18	+88 59
	s	″		s	″		s	″		s	″
1.2	33.91	26.2	1.4	14.79	10.8	1.9	30.30	43.2	1.9	50.38	31.9
2.2	33.06	26.1	2.4	14.64	11.1	2.9	30.50	42.9	2.9	50.70	31.6
3.2	32.18	26.0	3.4	14.49	11.3	3.9	30.70	42.7	3.9	51.01	31.4
4.2	31.28	26.0	4.4	14.35	11.6	4.9	30.90	42.4	4.9	51.31	31.1
5.2	30.33	25.9	5.4	14.21	11.9	5.9	31.11	42.1	5.9	51.65	30.8
6.2	29.30	25.8	6.4	14.05	12.2	6.9	31.34	41.8	6.9	52.04	30.4
7.2	28.26	25.7	7.4	13 85	12.5	7.9	31.59	41.6	7.9	52.51	30.1
8.2	27.19	25.6	8.4	13.64	12.8	8.9	31.88	41.3	8.9	53.05	29.8
9.2	26.15	25.4	9.4	13.40	13.1	9.9	32.18	41.0	9.9	53.68	29.4
10.2	25.16	25.3	10.4	13.13	13.4	10.9	32.48	40.8	10.9	54.36	29.1
11.2	24.23	25.1	11.4	12.84	13.7	11.9	32.79	40.6	11.9	55.07	28.8
12.2	23.36	24.9	12.4	12.55	13.9	12.9	33.09	40.4	12.9	55.78	28.6
13.2	22.57	24.7	13.4	12.28	14.2	13.9	33.38	40.2	13.9	56.47	28.3
14.2	21.82	24.6	14.4	12.01	14.4	14.9	33.65	40.1	14.9	57.13	28.1
15.1	21.08	24.4	15.4	11.75	14.6	15.9	33.90	39.9	15.9	57.74	27.9
16.1	20.36	24.2	16.4	11.52	14.8	16.8	34.16	39.7	16.9	58.32	27.6
17.1	19.61	24.1	17.4	11.29	15.0	17.8	34.41	39.5	17.9	58.87	27.4
18.1	18.81	24.0	18.4	11.06	15.3	18.8	34.69	39.3	18.9	59.44	27.1
19.1	17.96	23.8	19.4	10.82	15.5	19.8	34.96	39.1	19.9	60.07	26.8
20.1	17.08	23.6	20.4	10.55	15.8	20.8	35.26	38.9	20.9	60.76	26.6
21.1	16.17	23.5	21.4	10.26	16.0	21.8	35.59	38.7	21.9	61.52	26.3
22.1	15.26	23.2	22.4	9.94	16.3	22.8	35.94	38.5	22.9	62.38	26.0
23.1	14.38	23.0	23.4	9.58	16.5	23.8	36.30	38.3	23.9	63.30	25.7
24.1	13.56	22.8	24.3	9.21	16.8	24.8	36.68	38.2	24.9	64.28	25.4
25.1	12.79	22.5	25.3	8.82	17.0	25.8	37.04	38.0	25.9	65.31	25.2
26.1	12.10	22.3	26.3	8.44	17.1	26.8	37.41	37.9	26.9	66.31	25.0
27.1	11.44	22.0	27.3	8.06	17.3	27.8	37.76	37.8	27.9	67.29	24.8
28.1	10.87	21.8	28.3	7.69	17.4	28.8	38.10	37.7	28.9	68.23	24 7
29.1	10.31	21.5	29.3	7.34	17.6	29.8	38.43	37.6	29.9	69.13	24.5

MARCH, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris.*)		Mean Solar Date.	51 Cephei (HEV.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	1 22	+88 47	Mar.	6 54	+87 12	Mar.	18 03	+86 36	Mar.	19 19	+88 59
	s	″		s	″		s	″		s	″
1.1	70.31	21.5	1.3	67.34	17.6	1.8	38.43	37.6	1 9	9.13	24.5
2.1	69.73	21.3	2.3	67.02	17.8	2.8	38.74	37.5	2.9	9.98	24.3
3.1	69.14	21 1	3.3	66.69	17.9	3.8	39.06	37.4	3.9	10.81	24.1
4.1	68.52	20.8	4.3	66.36	18.1	4.8	39.39	37.3	4.9	11.65	23.9
5.1	67.84	20.6	5.3	66.04	18.3	5.8	39.71	37.2	5.9	12.54	23.7
6.1	67.14	20.4	6.3	65.68	18.4	6 8	40.06	37.0	6.9	13.50	23.5
7.1	66.43	20.1	7.3	65.30	18.6	7 8	40.42	36.9	7.9	14.52	23.3
8.1	65.73	19.9	8 3	64.89	18.8	8 8	40.81	36.8	8.9	15.61	23.1
9.1	65.07	19.6	9.3	64.48	19.0	9 8	41.21	36.7	9.8	16.75	22.9
10.1	64.48	19.3	10.3	64.04	19.2	10.8	41.60	36.7	10.8	17.93	22.7
11.1	63.95	19.0	11.3	63.60	19.3	11.8	41.99	36.6	11 8	19 10	22.5
12.1	63.49	18.7	12.3	63.16	19.4	12.8	42.36	36.6	12.8	20.27	22.4
13.1	63.10	18.4	13.3	62.75	19.5	13.8	42.71	36.6	13.8	21.39	22.3
14.1	62.77	18.1	14.3	62.34	19.5	14.8	43.05	36.6	14.8	22.46	22.2
15.1	62.45	17.8	15.3	61.96	19.6	15.8	43.38	36.6	15.8	23.46	22.1
16.1	62.12	17.5	16.3	61.59	19.7	16.8	43.70	36.6	16.8	24.43	22.0
17.1	61.77	17.3	17.3	61.23	19.8	17.8	44.02	36.5	17.8	25.38	21.9
18.1	61.37	17.0	18.3	60.87	19.9	18.8	44.35	36.5	18.8	26 38	21.7
19.1	60.94	16.8	19.3	60.49	20.0	19.8	44.70	36.4	19.8	27.42	21.6
20.1	60.48	16.5	20.3	60.09	20.1	20.8	45.07	36.4	20.8	28.52	21.4
21.1	59.99	16.2	21.3	59.68	20.2	21.8	45.45	36.4	21.8	29.70	21.3
22.0	59.55	15.9	22.3	59.23	20.3	22.7	45.86	36.3	22.8	30 96	21.2
23.0	59.15	15.6	23.3	58.76	20.4	23.7	46.26	36.4	23.8	32.26	21.1
24.0	58.80	15.2	24.3	58.28	20.4	24.7	46.68	36.4	24.8	33.59	21.0
25.0	58.55	14.9	25.3	57.80	20.5	25.7	47.07	36.4	25.8	34.91	20.9
26.0	58.37	14.5	26.3	57.33	20.5	26.7	47.46	36.5	26.8	36.21	20.9
27.0	58.25	14.2	27.3	56 87	20.5	27.7	47 81	36.6	27 8	37.45	20.8
28.0	58.15	13.9	28.3	56.44	20.5	28.7	48.15	36.7	28.8	38.63	20.8
29.0	58.07	13.6	29.3	56.02	20.5	29 7	48.49	36 7	29 8	39.76	20 8
30.0	57.98	13.3	30.3	55.62	20.5	30.7	48 82	36.8	30.8	40.85	20 8
31.0	57.85	13.0	31.3	55.24	20.5	31.7	49 14	36.9	31.8	41.93	20.7
32.0	57.69	12.7	32.2	54.84	20.5	32.7	49.48	36.9	32.8	43.02	20.7

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (Hɛv.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	1 22	+88 47	Apr.	6 54	+87 12	Apr.	18 03	+86 36	Apr.	19 19	+88 59
	s	″		s	″		s	″		s	″
1.0	57.69	12.7	1.2	54.84	20.5	1.7	49.48	36.9	1.8	43.02	20.7
2.0	57.48	12.4	2.2	54.43	20.5	2.7	49.83	36.9	2.8	44.16	20.6
3.0	57.28	12.1	3.2	54.01	20.5	3.7	50.19	37.0	3.8	45.35	20.6
4.0	57.08	11.8	4.2	53.56	20.6	4.7	50 56	37.0	4.8	46.60	20.5
5.0	56.91	11.5	5.2	53.11	20.6	5.7	50.95	37.1	5.8	47.90	20.5
6.0	56.81	11.1	6 2	52.64	20.6	6.7	51.33	37.2	6.8	49.23	20.4
7.0	56.78	10.8	7.2	52.16	20.5	7.7	51.70	37.3	7.8	50.57	20.4
8.0	56.82	10.4	8.2	51.69	20.5	8.7	52.05	37.5	8.8	51.88	20.5
9.0	56.93	10.1	9.2	51.24	20.4	9.7	52.40	37.6	9.8	53.14	20.5
10.0	57.08	9 7	10.2	50.80	20.3	10.7	52.72	37.8	10.8	54.35	20.6
10.9	57.28	9.4	11.2	50.40	20.2	11.7	53.02	38.0	11.8	55.48	20.6
11.9	57.48	9.2	12.2	50.03	20.1	12.7	53.31	38.1	12.8	56.55	20.7
12.9	57.65	8.9	13.2	49.66	20.0	13.7	53.59	38.2	13.8	57.60	20.8
13.9	57.80	8.6	14.2	49.29	20.0	14.7	53.88	38.4	14.8	58.64	20.8
14.9	57.89	8.3	15.2	48.93	19.9	15.7	54.17	38.5	15.8	59.71	20.8
15.9	57.97	8.0	16.2	48.55	19.9	16.7	54.48	38.6	16.8	60.82	20.9
16.9	58.02	7.7	17.2	48.16	19.8	17.7	54.80	38.7	17.7	61.99	20.9
17.9	58.08	7.4	18.2	47.74	19.8	18.7	55.14	38.9	18.7	63.23	20.9
18 9	58.19	7.1	19.2	47.30	19.7	19.7	55.49	39.0	19.7	64.52	21.0
19.9	58.36	6.8	20.2	46.85	19.6	20.7	55.84	39.2	20.7	65.82	21.0
20.9	58.56	6.4	21.2	46.40	19.5	21.7	56.18	39.4	21.7	67.13	21.1
21.9	58.90	6.1	22.2	45.96	19.4	22.7	56.51	39.7	22.7	68.41	21.2
22.9	59.27	5.7	23.2	45.54	19.2	23.7	56.80	39.9	23.7	69.62	21.4
23.9	59.69	5.4	24.2	45.13	19.0	24.7	57.08	40.1	24.7	70.78	21.5
24.9	60.13	5.1	25.2	44.77	18.8	25.7	57.34	40.4	25.7	.71.86	21.7
25.9	60.56	4.8	26.2	44.42	18.7	26.7	57.58	40.6	26.7	72.88	21.8
26.9	60.98	4.6	27.2	44.07	18.5	27.7	57.82	40.8	27.7	73.87	22.0
27.9	61.36	4.3	28.2	43.75	18.4	28.7	58.06	41.0	28.7	74.86	22.1
28.9	61.70	4.1	29.2	43.41	18.2	29.6	58.32	41.2	29.7	75.86	22.2
29.9	62.00	3.8	30.2	43.07	18.1	30.6	58.58	41.4	30.7	76.90	22.3
30.9	62.30	3.5	31.2	42.71	18.0	31.6	58.86	41.6	31.7	77.99	22.4
31.9	62.62	3.2									

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris (*Polaris.*)		Mean Solar Date.	51 Cephei (Hɛv.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension	Declination *North.*
May	h m 1 23	° ′ +88 46	May	h m 6 54	° ′ +87 12	May	h m 18 03	° ′ +86 36	May	h · m 19 20	° ′ +88 59
	s 2.62	″ 63.2		s 42.71	″ 18.0		s 58.86	″ 41.6		s 17.99	″ 22.4
1.9	2.62	63.2	1.2	42.71	18.0	1.6	58.86	41.6	1.7	17.99	22.4
2.9	2.99	62.9	2.2	42.33	17.9	2.6	59.14	41.8	2.7	19.12	22.5
3.9	3.42	62.6	3.2	41.96	17.7	3.6	59.43	42.0	3.7	20.29	22.6
4.9	3.92	62.3	4.2	41.57	17.5	4.6	59.70	42.2	4 7	21.46	22.8
5.9	4.50	62.0	5.2	41.18	17.3	5.6	59.96	42.5	5.7	22.59	23.0
6.9	5.14	61.7	6.2	40.82	17.1	6.6	60.20	42.8	6.7	23.69	23.2
7.9	5.82	61.5	7.1	40.48	16.9	7.6	60.42	43.1	7.7	24.71	23.4
8.9	6.50	61.2	8.1	40.17	16.7	8.6	60.61	43.4	8.6	25.66	23.6
9.9	7.16	61.0	9.1	39.89	16.4	9.6	60.77	43.7	9.6	26.53	23.8
10.9	7.81	60.8	10.1	39.63	16.2	10.6	60.94	44.0	10.6	27.34	24.0
11.9	8.39	60.6	11.1	39.39	16.0	11.6	61.09	44.2	11.6	28.13	24.2
12.9	8.94	60.4	12.1	39.15	15.8	12.6	61.26	44.4	12.6	28.92	24.4
13.9	9.47	60.2	13.1	38.89	15.6	13.6	61.43	44.7	13.6	29.74	24.6
14.9	9.99	59.9	14.1	38.62	15.4	14.6	61.63	44.9	14.6	30.62	24.7
15.9	10.53	59.7	15.1	38.34	15.2	15.6	61.83	45.2	15.6	31.54	24.9
16.9	11.13	59.4	16.1	38.05	15.0	16.6	62.04	45.4	16.6	32.52	25.1
17.9	11.79	59.2	17.1	37.72	14.8	17.6	62.25	45.7	17.6	33.51	25.3
18.9	12.50	58.9	18.1	37.41	14.6	18.6	62.46	46.0	18.6	34.50	25.5
19.9	13.30	58.6	19.1	37.11	14.3	19.6	62.65	46.4	19.6	35.47	25.8
20.9	14.14	58.4	20.1	36.82	14.0	20.6	62.82	46.7	20.6	36.38	26.0
21.9	14.99	58.2	21.1	36.56	13.8	21.6	62.95	47.0	21.6	37.22	26.3
22.9	15.87	58.0	22.1	36.32	13.5	22.6	63.08	47.4	22.6	37.98	26.6
23.9	16.70	57.8	23.1	36.11	13.2	23.6	63.18	47.7	23.6	38.68	26.8
24.9	17.50	57.7	24.1	35.93	12.9	24.6	63.26	48.0	24.6	39.31	27.1
25.9	18.25	57.5	25.1	35.76	12.6	25.6	63.35	48.3	25.6	39.92	27.4
26.9	18.96	57.4	26.1	35 58	12.4	26.6	63.45	48.5	26.6	40.53	27.6
27.9	19.66	57.2	27.1	35.41	12.2	27.6	63.55	48 8	27.6	41.17	27.8
28.9	20.36	57.0	28.1	35.23	11.9	28.6	63.66	49.1	28.6	41.84	28.0
29.9	21.09	56.8	29.1	35.02	11.7	29.6	63.78	49.4	29.6	42.56	28.3
30.9	21.87	56.6	30.1	34.80	11.4	30.6	63.91	49.6	30.6	43.30	28.5
31.9	22.71	56.4	31.1	34.60	11.2	31.6	64.03	50.0	31.6	44.04	28 8
32.9	23.61	56.2	32.1	34.38	10.9	32.6	64.13	50.3	32.6	44.77	29.0

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris (*Polaris*). Right Ascension.	Declination North.	Mean Solar Date.	51 Cephei (Hev.). Right Ascension.	Declination North.	Mean Solar Date.	δ Ursæ Minoris. Right Ascension.	Declination North.	Mean Solar Date.	λ Ursæ Minoris. Right Ascension.	Declination North.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	1 23	+88 46	June	6 54	+87 12	June	18 04	+86 36	June	19 20	+88 59
	s	″		s	″		s	″		s	″
1.9	23.61	56.2	1.1	34.38	10.9	1.6	4.13	50.3	1.6	44.77	29.0
2.9	24.57	56.1	2.1	34.18	10.6	2.6	4.22	50.7	2.6	45.44	29.3
3.8	25.58	55.9	3 1	34.01	10.3	3.5	4.28	51.0	3.6	46.05	29.6
4.8	26.61	55.8	4.1	33.87	9.9	4.5	4.32	51.4	4.6	46.58	30.0
5.8	27.61	55.7	5.1	33.77	9.6	5.5	4.34	51.7	5.6	47.03	30.3
6.8	28.60	55.6	6.1	33.68	9 3	6.5	4.33	52.1	6.6	47.41	30.6
7.8	29.54	55.5	7.1	33.61	9.0	7.5	4.32	52.4	7.6	47.73	30.9
8.8	30.40	55.4	8.1	33.56	8.7	8.5	4.31	52.7	8.6	48.04	31.2
9.8	31.26	55.3	9.1	33.50	8.4	9.5	4.31	53.0	9.6	48.37	31.5
10.8	32.07	55.2	10.1	33.42	8.1	10.5	4.32	53.3	10.6	48.73	31.8
11.8	32.90	55.1	11.1	33.34	7.9	11.5	4.36	53.6	11.6	49.13	32.0
12.8	33.76	55.0	12.1	33.25	7.6	12.5	4.40	53.8	12.6	49.60	32.3
13.8	34.68	54.9	13.0	33.14	7.3	13.5	4.44	54.2	13.6	50.09	32.6
14.8	35.64	54.7	14.0	33.01	7.0	14.5	4.47	54.5	14.6	50.59	32.9
15.8	36.68	54.6	15.0	32.90	6.7	15.5	4.50	54.8	15.6	51.06	33.2
16.8	37.74	54.5	16.0	32.80	6.4	16.5	4.50	55.2	16.6	51.49	33.5
17.8	38.86	54.4	17.0	32.73	6.0	17.5	4.48	55.6	17.6	51.85	33.9
18.8	39.98	54.4	18.0	32.68	5.7	18.5	4.44	55.9	18.6	52.12	34.2
19.8	41.05	54.3	19.0	32.67	5.3	19.5	4.37	56.3	19.6	52.30	34.6
20.8	42.11	54.3	20.0	32.67	5.0	20.5	4.29	56.6	20.6	52.42	34.9
21.8	43.10	54.3	21.0	32.69	4.7	21.5	4.21	56.9	21.6	52.49	35.3
22.8	44.04	54.2	22.0	32.73	4.4	22.5	4.12	57.2	22.6	52.57	35.6
23.8	44.95	54.2	23.0	32.76	4.1	23.5	4.04	57.5	23.6	52.66	35.9
24.8	45.83	54.2	24.0	32.79	3.8	24.5	3.97	57.8	24.6	52.78	36.2
25.8	46.73	54.2	25.0	32.80	3.5	25.5	3.92	58.1	25.6	52.95	36.4
26.8	47.68	54.1	26.0	32.79	3.2	26.5	3.87	58.4	26.6	53.14	36.7
27.8	48.67	54.1	27.0	32.79	2.9	27.5	3.82	58.7	27.6	53.34	37.0
28.8	49.73	54.0	28.0	32.78	2.6	28.5	3.76	59.0	28.6	53.53	37.4
29.8	50.84	54.0	29.0	32.78	2.3	29.5	3.68	59.4	29.5	53.68	37 7
30.8	52.00	54.0	30.0	32.82	1.9	30.5	3.58	59.7	30.5	53.76	38.1
31.8	53.16	54.0	31.0	32.87	1.6	31.5	3.45	60.1	31.5	53.76	38.4

JULY, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (HEV.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° '		h m	° '		h m	° '		h m	° '
July	1 23	+88 46	July	6 54	+87 11	July	18 03	+86 37	July	19 20	+88 59
	s	"		s	"		s	"		s	"
1.8	53.16	54.0	1.0	32.87	61.6	1.5	63.45	0.1	1.5	53.76	38.4
2.8	54.33	54.0	2.0	32.95	61.2	2.5	63.30	0.4	2.5	53.67	38.8
3.8	55.46	54.0	3.0	33.07	60.9	3.5	63.13	0.8	3.5	53.51	39.2
4.8	56.53	54.1	3.9	33.21	60.5	4.5	62.95	1.1	4.5	53.28	39.5
5.8	57.55	54.2	4.9	33.36	60.2	5.5	62.77	1.4	5.5	53.03	39.8
6.8	58.52	54.2	5.9	33.51	59.9	6.5	62.59	1.7	6.5	52.79	40.2
7.8	59.47	54.3	6.9	33.66	59.6	7.5	62.42	1.9	7.5	52.57	40.5
8.8	60.39	54.3	7.9	33.79	59.4	8.5	62.27	2.2	8.5	52.39	40.8
9.8	61.33	54.4	8.9	33.91	59.1	9.5	62.14	2.5	9.5	52.25	41.1
10.7	62.31	54.4	9.9	34.01	58.8	10.5	62.00	2.7	10.5	52.15	41.4
11.7	63.32	54.4	10.9	34.09	58.5	11.5	61.87	3.0	11.5	52.07	41.7
12.7	64.39	54.4	11.9	34.18	58.2	12.4	61.74	3.4	12.5	51.99	42.0
13.7	65.51	54.5	12.9	34.29	57.8	13.4	61.57	3.7	13.5	51.86	42.4
14.7	66.66	54.5	13.9	34.41	57.5	14.4	61.40	4.0	14.5	51.68	42.7
15.7	67.83	54.6	14.9	34.55	57.2	15.4	61.19	4.3	15.5	51.41	43.1
16.7	68.96	54.7	15.9	34.72	56.8	16.4	60.97	4.7	·16.5	51.06	43.4
17.7	70.06	54.8	16.9	34.94	56.5	17.4	60.73	5.0	17.5	50.63	43.8
18.7	71.10	54.9	17.9	35.16	56.1	18.4	60.47	5.3	18.5	50.16	44.2
19.7	72.08	55.0	18.9	35.39	55.8	19.4	60.23	5.5	19.5	49.67	44.5
20.7	73.02	55.2	19.9	35.63	55.6	20.4	59.97	5.8	20.5	49.19	44.8
21.7	73.92	55.3	20.9	35.86	55.3	21.4	59.75	6.0	21.5	48.72	45.1
22.7	74.81	55.4	21.9	36.09	55.0	22.4	59.53	6.2	22.5	48.28	45.4
23.7	75.73	55.5	22.9	36.28	54.8	23.4.	59.32	6.5	23.5	47.90	45.6
24.7	76.69	55.6	23.9	36.48	54.5	24.4	59.12	6.7	24.5	47.53	45.9
25.7	77.70	55.7	24.9	36.68	54.2	25.4	58.91	7.0	25.5	47.17	46.2
26.7	78.77	55.8	25.9	36.87	53.9	26.4	58.68	7.3	26.5	46.77	46.6
27.7	79.87	56.0	26.9	37.08	53.6	27.4	58.44	7.6	27.5	46.32	46.9
28.7	81.01	56.1	27.9	37.32	53.3	28.4	58.16	7.9	28.5	45.80	47.3
29.7	82.15	56.3	28.9	37.58	53.0	29.4	57.87	8.1	29.5	45.20	47.6
30.7	83.23	56.4	29.9	37.88	52.6	30.4	57.56	8.4	30.5	44.51	48.0
31.7	84.28	56.6	30.9	38.19	52.3	31.4	57.23	8.7	31.5	43.76	48.3
32.7	85.27	56.8	31.9	38.53	52.0	32.4	56.91	8.9	32.5	42.96	48.6

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (HEV.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
A ·g.	1 24	+88 46	Aug.	6 54	+87 11	Aug.	18 03	+86 37	Aug.	19 20	+88 59
	s	″		s	″		s	″		s	″
1.7	25.27	56.8	1 9	38.88	51.8	1.4	56.91	8.9	1.5	42.96	48.6
2.7	26.18	57.1	2.9	39.22	51.5	2.4	56.58	9.1	2.4	42.17	48.9
3.7	27.05	57.3	3.9	39.54	51.3	3 4	56.26	9.3	3.4	41.38	49.2
4.7	27.89	57.4	4.9	39.84	51.0	4.4	55.95	9.5	4.4	40.65	49.5
5.7	28.74	57.6	5.9	40.13	50.8	5.4	55.67	9.7	5.4	39.97	49.7
6.7	29.60	57.8	6.9	40.41	50.5	6.4	55.40	9.9	6.4	39.33	50.0
7 7	30.50	57.9	7.9	40.67	50.3	7.4	55.13	10.1	7.4	38.71	50.3
8.7	31.46	58.1	8.9	40 95	50.0	8.4	54.85	10.3	8.4	38.08	50.6
9.7	32.45	58.3	9.9	41.24	49.7	9.4	54.57	10.6	9.4	37.43	50.9
10.7	33.49	58.5	10.9	41.56	49.4	10.4	54.25	10.8	10.4	36.75	51.2
11.7	34.52	58.7	11.9	41.90	49.1	11.4	53.92	11.1	11.4	35.99	51.5
12.7	35.54	58.9	12.9	42.26	48.8	12.4	53.57	11.3	12.4	35.15	51.8
13.7	36.52	59.1	13.9	42.64	48.6	13.4	53.21	11.5	13.4	34.24	52.1
14.7	37.45	59.4	14.9	43 06	48.3	14.4	52.84	11.7	14.4	33.28	52.4
15.6	38.31	59.6	15.9	43.46	48.1	15.4	52.46	11.9	15.4	32.28	52.7
16.6	39.11	59.9	16.9	43.85	47.9	16.3	52.09	12.1	16.4	31.29	53.0
17.6	39.86	60.2	17.9	44.25	47.7	17.3	51.74	12.2	17.4	30.31	53.2
18.6	40.59	60.4	18.9	44 62	47.5	18.3	51.39	12.4	18.4	29.36	53.5
19.6	41.32	60.6	19.9	44.97	47.3	19.3	51.05	12.5	19.4	28.47	53.7
20.6	42.09	60.9	20.9	45.32	47.1	20.3	50.73	12.6	20.4	27.61	53.9
21.6	42.90	61.1	21.9	45.68	46.8	21.3	50.41	12.8	21.4	26.76	54.2
22.6	43.77	61.3	22.9	46.03	46.6	22.3	50.08	13.0	22.4	25.90	54.4
23.6	44.66	61.5	23.9	46.42	46.4	23.3	49.72	13.2	23.4	25.00	54.7
24.6	45.59	61.8	24.8	46.82	46.1	24.3	49.36	13.4	24.4	24.03	55.0
25.6	46.53	62.1	25.8	47.25	45.8	25.3	48.96	13.6	25.4	22.99	55.3
26.6	47.44	62.4	26.8	47.72	45.6	26.3	48.54	13.7	26.4	21.87	55.6
27.6	48.29	62.7	27.8	48.19	45.4	27.3	48.13	13.9	27.4	20.68	55.8
28.6	49.09	63.0	28.8	48.67	45.2	28.3	47.69	14.0	28.4	19.46	56.1
29.6	49.82	63.3	29.8	49 15	45.0	29.3	47.25	14.1	29.4	18.21	56.3
30.6	50 48	63.6	30 8	49.63	44.9	30.3	46.84	14.2	30 4	16.98	56.5
31.6	51.11	63.9	31.8	50.08	44.7	31.3	46.43	14.3	31.4	15 79	56.7
32.6	51.70	64.2	32 8	50.50	44.6	32 3	46.05	14.4	32.4	14.65	56.9

SEPTEMBER, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	1 24	+88 47	Sept.	6 54	+87 11	Sept.	18 03	+86 37	Sept.	19 19	+88 59
	s	″		s	″		s	″		s	″
1 6	51.70	4.2	1.8	50.50	44.6	1.3	46.05	14.4	1.4	74.65	56.9
2.6	52.31	4.5	2 8	50.93	44.4	2.3	45.68	14.5	2.4	73.56	57.1
3.6	52.95	4.8	3.8	51.33	44.2	3.3	45.32	14.6	3.4	72.52	57.3
4.6	53.62	5.0	4.8	51.72	44.1	4.3	44.96	14.7	4.4	71.49	57.5
5.6	54.34	5.3	5.8	52.14	43.9	5.3	44.60	14 8	5.4	70.46	57.7
6.6	55.10	5.6	6.8	52.57	43.7	6.3	44.23	14.9	6.4	69.39	57.9
7.6	55.87	5.9	7.8	53.02	43.5	7.3	43.82	15.1	7.4	68.26	58.2
8.6	56.65	6.2	8 8	53.50	43.3	8.3	43.40	15.2	8.4	67.07	58 4
9.6	57.38	6.6	9.8	54.00	43.1	9.3	42.97	15.3	9.4	65.80	58.6
10.6	58.05	6.9	10.8	54.51	43.0	10.3	42.52	15.4	10.3	64.46	58.9
11.6	58.67	7.3	11.8	55.04	42.8	11.3	42.08	15.4	11.3	63.09	59.1
12.6	59.20	7.6	12.8	55.55	42.7	12.3	41.65	15 5	12.3	61.72	59.2
13.6	59.69	8.0	13.8	56.04	42.6	13.3	41.22	15.5	13.3	60.37	59.4
14.6	60.12	8.3	14.8	56.54	42.5	14.3	40.81	15.5	14.3	59.07	59.5
15.6	60.56	8.6	15.8	56.99	42.4	15.3	40.41	15.5	15.3	57.80	59.7
16.6	61.02	9.0	16.8	57.45	42.3	16.3	40.02	15.6	16.3	56 59	59.8
17.6	61.51	9.3	17.8	57.90	42.2	17.3	39.64	15.6	17.3	55.40	59.9
18.6	62.03	9.6	18.8	58.37	42.1	18.3	39.26	15.6	18.3	54 22	60.1
19.6	62.62	9.9	19.8	58.81	41.9	19.3	38.87	15.7	19.3	53.01	60 2
20.6	63.21	10.2	20.8	59.30	41.8	20.3	38.45	15.8	20.3	51.77	60.4
21.5	63.83	10.6	21.8	59.81	41.6	21.3	38.03	15.8	21.3	50.46	60.6
22.5	64.42	10.9	22.8	60.34	41.5	22.2	37.57	15.9	22.3	49.08	60.8
23.5	64.96	11.3	23.8	60.90	41.4	23.2	37.10	15.9	23.3	47.62	60.9
24.5	65.46	11.7	24.8	61.47	41.3	24.2	36.63	15.9	24.3	46.11	61.1
25.5	65.87	12.1	25.8	62.04	41.2	25.2	36.16	15.9	25.3	44.59	61.2
26.5	66.22	12.5	26.8	62.58	41.2	26.2	35.69	15.9	26 3	43.08	61.3
27.5	66.51	12.9	27.8	63.12	41.1	27.2	35.25	15.8	27.3	41.59	61.4
28.5	66.77	13.2	28.8	63.62	41.1	28.2	34.83	15.8	28.3	40.17	61.5
29.5	67.02	13.6	29.8	64.12	41.1	29.2	34.42	15.7	29.3	38.81	61.6
30.5	67.29	13.9	30.8	64.59	41.0	30.2	34.03	15.7	30.3	37.49	61.6
31.5	67.60	14.2	31.7	65.05	41.0	31.2	33.64	15.7	31.3	36.22	61.7

(CONSTANTS OF STRUVE AND PETERS.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar l ate.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	1 25	+88 47	Oct.	6 55	+87 11	Oct.	18 03	+86 37	Oct.	19 18	+89 00
	s	″		s	″		s	″		s	″
1.5	7.60	14.2	1.7	5.05	41.0	1.2	33.64	15.7	1.3	96.22	1 7
2.5	7.94	14.6	2.7	5.52	40.9	2.2	33.26	15.7	2.3	94.96	1.8
3.5	8.32	14.9	3.7	6.01	40.8	3.2	32.87	15.6	3.3	93.68	1.9
4.5	8.74	15.3	4.7	6.51	40.7	4.2	32.46	15.6	4.3	92.35	2.0
5.5	9.13	15.6	5.7	7.03	40.6	5.2	32.04	15.6	5.3	90.97	2.1
6.5	9.52	16.0	6.7	7.57	40.6	6.2	31.60	15.6	6.3	89.53	2.3
7.5	9.83	16.4	7.7	8.13	40.5	7.2	31.15	15.6	7.3	88.04	2.4
8.5	10.08	16.8	8.7	8.70	40.5	8.2	30.70	15.5	8.3	86.49	2.4
9.5	10.26	17.2	9.7	9.25	40.5	9.2	30.24	15.4	9.3	84.94	2.5
10.5	10.38	17.6	10.7	9.79	40.6	10.2	29.81	15.3	10.3	83.42	2.5
11.5	10.46	18.0	11.7	10.32	40.6	11.2	29.39	15.2	11.3	81.94	2.5
12.5	10.49	18.4	12.7	10.83	40.6	12.2	29.00	15.1	12.3	80.50	2.6
13.5	10.54	18.7	13.7	11.30	40.6	13.2	28.62	15.0	13.3	79.13	2.6
14 5	10.61	19.1	14.7	11.78	40.7	14.2	28.25	14.9	14.3	77.81	2.6
15.5	10.72	19.4	15.7	12.26	40.7	15.2	27.88	14.8	15.3	76.49	2.6
16.5	10.87	19.8	16.7	12.73	40.7	16.2	27.50	14.7	16.2	75.19	2.6
17.5	11.06	20.1	17.7	13.23	40.6	17.2	27.10	14.6	17.2	73.85	2.6
18.5	11.26	20.5	18.7	13.75	40.6	18.2	26.71	14.6	18.2	72.45	2.7
19.5	11.46	20.8	19.7	14.30	40.6	19.2	26.29	14.5	19.2	70.99	2.7
20.5	11.62	21.2	20.7	14.86	40.6	20.2	25.86	14.4	20.2	69.48	2.8
21.5	11.72	21.6	21.7	15.42	40.6	21.2	25.41	14.3	21.2	67.92	2.8
22.5	11.75	22.1	22.7	15.99	40.7	22.2	24.97	14.1	22.2	66.32	2.8
23.5	11.70	22.5	23.7	16.55	40.8	23.2	24.54	14.0	23.2	64.74	2.8
24.5	11.59	22.9	24.7	17.09	40.9	24.2	24.12	13.8	24.2	63.19	2.8
25.5	11.42	23.3	25.7	17.61	41.0	25.2	23.74	13.6	25.2	61.70	2.7
26.5	11.26	23.6	26.7	18.10	41.1	26.2	23.37	13.4	26.2	60.27	2.6
27.5	11.09	24.0	27.7	18.58	41.2	27.2	23.02	13.2	27.2	58.93	2.6
28.4	10.95	24.3	28.7	19.03	41.2	28.1	22.68	13.1	28.2	57.61	2.5
29.4	10.85	24.6	29.7	19.47	41.3	29.1	22.35	12.9	29.2	56.35	2.4
30.4	10.79	25.0	30.7	19.93	41.4	30.1	22.01	12.8	30.2	55.07	2.4
31.4	10.74	25.3	31.7	20 40	41.4	31.1	21.67	12.6	31.2	53.76	2.4
32.4	10.72	25.7	32.7	20.89	41.5	32.1	21.31	12.5	32.2	52.46	2.4

NOVEMBER, 1902.

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Nov.	h m 1 24	° ′ +88 47	Nov.	h m 6 55	° ′ +87 11	Nov.	h m 18 03	° ′ +86 37	Nov.	h m 19 18	° ′ +88 59
	s	″		s	″		s	″		s	″
1.4	70.72	25.7	1.7	20.89	41.5	1.1	21.31	12.5	1.2	52.46	62.4
2.4	70.67	26.1	2.7	21.40	41.6	2.1	20.94	12.4	2.2	51.07	62.3
3.4	70.56	26.4	3.7	21.90	41.6	3.1	20.55	12.2	3.2	49.62	62.3
4.4	70.42	26.8	4.7	22.44	41.7	4.1	20.17	12.0	4.2	48.14	62.2
5.4	70.19	27.2	5.7	22.98	41.8	5.1	19.79	11.8	5.2	46.65	62.2
6.4	69.88	27.6	6.6	23.49	42.0	6.1	19.42	11.6	6.2	45.19	62 1
7.4	69.53	28.0	7.6	23.98	42.2	7.1	19.07	11.3	7.2	43.77	62.0
8.4	69.12	28.3	8.6	24.45	42.3	8.1	18.74	11.1	8.2	42.40	61.8
9.4	68.72	28.7	9.6	24.89	42.5	9.1	18.44	10.8	9.2	41.09	61 7
10.4	68.34	29.0	10.6	25.30	42.6	10.1	18.14	10.6	10.2	39.86	61.5
11.4	67.99	29.3	11.6	25.71	42.8	11.1	17.85	10.4	11.2	38.67	61.4
12.4	67.68	29.6	12.6	26.13	42.9	12.1	17.57	10.1	12.2	37.48	61.3
13.4	67.42	29.9	13.6	26.55	43.0	13.1	17.28	9.9	13.2	36.29	61.2
14.4	67.17	30.3	14.6	26.99	43.2	14.1	16.97	9.7	14.2	35.07	61.1
15.4	66.91	30.6	15.6	27.45	43.3	15.1	16.65	9.5	15.2	33.80	61.0
16.4	66.64	31.0	16.6	27.93	43.4	16.1	16.32	9.3	16.2	32.47	60.9
17.4	66.32	31.3	17.6	28.41	43.6	17.1	15.97	9.1	17.2	31.10	60.8
18.4	65.92	31.7	18.6	28.90	43.7	18.1	15.64	8.9	18.2	29.69	60.6
19.4	65.46	32.1	19.6	29.38	43.9	19.1	15.31	8.6	19.2	28.29	60.5
20.4	64.93	32.4	20.6	29.84	44.1	20.1	14.99	8.3	20.1	26.93	60.3
21.4	64.35	32.8	21.6	30.28	44 4	21.1	14.71	8.0	21.1	25.63	60.1
22.4	63.74	33.1	22.6	30.68	44.6	22.1	14.44	7.7	22.1	24.39	59 9
23.4	63.12	33.4	23.6	31.06	44.8	23.1	14.21	7.4	23.1	23.24	59.7
24.4	62.53	33.7	24.6	31.42	45.0	24.1	13.98	7.1	24.1	22.16	59 5
25.4	61.96	34.0	25.6	31.77	45.2	25.1	13 77	6.8	25.1	21.13	59.3
26.4	61.45	34.2	26.6	32.11	45.4	26.1	13.56	6.6	26.1	20.14	59.1
27.4	60.95	34.5	27.6	32.47	45.6	27.1	13.34	6.3	27.1	19 13	59 0
28.4	60.49	34.8	28.6	32.83	45.8	28.1	13.13	6.1	28.1	18.10	58 8
29.4	60.02	35.1	29.6	33.22	46.0	29.1	12.89	5.8	29.1	17.03	58.6
30.4	59.51	35.4	30.6	33.62	46.2	30.1	12.65	5.6	30 1	15.91	58.5
31.4	58.95	35.7	31.6	34.01	46.4	31.1	12.40	5.3	31.1	14.75	58.3

(CONSTANTS OF STRUVE AND PETERS.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	1 24	+88 47	Dec.	6 55	+87 11	Dec.	18 03	+86 36	Dec.	19 17	+88 59
	s	″		s	″		s	″		s	″
1.4	58.95	35.7	1.6	34.01	46.4	1.1	12.40	65.3	1.1	74 75	58.3
2.4	58.32	36.0	2.6	34 41	46.6	2.1	12.15	65.0	2.1	73.58	58.1
3.3	57.62	36.3	3.6	34.80	46.9	3.1	11.93	64.7	3.1	72.43	57.8
4.3	56.85	36.6	4.6	35.16	47.2	4.0	11.71	64.3	4.1	71.33	57.6
5.3	56.05	36.8	5.6	35.50	47.5	5.0	11.52	64.0	5.1	70 29	57.3
6.3	55.21	37.1	6.6	35.81	47.8	6.0	11.36	63.6	6.1	69.32	57.1
7.3	54.40	37.3	7.6	36.09	48.0	7.0	11.21	63.3	7.1	68 44	56.8
8.3	53.62	37.6	8.6	36.36	48.3	8.0	11.08	63.0	8.1	67.61	56.5
9.3	52.89	37.8	9.6	36.63	48.5	9.0	10.95	62.7	9.1	66.82	56.3
10.3	52.19	38.0	10.6	36.89	48.8	10.0	10.82	62.4	10.1	66.03	56.0
11.3	51.53	38.2	11.6	37.16	49.0	11.0	10.69	62.1	11.1	65.24	55.8
12.3	50.89	38.4	12.5	37.45	49.2	12.0	10.53	61.8	12.1	64.40	55.6
13.3	50.25	38.7	13.5	37.76	49.5	13.0	10.37	61.5	13.1	63.51	55.4
14.3	49.54	38.9	14.5	38.07	49.7	14.0	10.20	61.2	14.1	62.58	55.1
15.3	48.79	39.2	15.5	38.39	50.0	15.0	10.03	60.9	15.1	61.63	54.9
16.3	47.98	39.5	16.5	38.71	50.3	16.0	9.87	60.6	16.1	60.67	54.6
17.3	47.08	39.7	17.5	39.01	50.6	17.0	9.72	60.2	17.1	59.76	54.4
18.3	46.15	39.9	18.5	39.27	50.9	18.0	9.58	59.8	18.1	58.89	54.0
19.3	45.16	40.1	19.5	39.51	51.2	19.0	9.48	59.5	19.1	58.10	53.7
20.3	44.20	40.3	20.5	39.71	51.6	20.0	9.40	59.1	20.1	57.40	53.4
21.3	43.24	40.5	21.5	39.90	51.9	21.0	9.36	58.7	21.1	56.80	53.1
22.3	42.31	40.6	22.5	40.06	52.2	22.0	9.32	58.4	22.1	56.25	52.8
23.3	41.44	40.8	23.5	40.21	52.5	23.0	9.29	58.1	23.1	55.75	52.5
24.3	40.61	40.9	24.5	40.36	52.7	24.0	9.26	57.8	24.1	55.26	52.2
25.3	39.80	41.0	25.5	40.52	53.0	25.0	9.23	57.5	25.1	54.77	52 0
26.3	39.00	41.2	26.5	40.69	53.3	26.0	9.17	57.2	26.0	54.24	51.7
27.3	38.18	41.4	27.5	40.87	53.5	27.0	9.12	56.9	27.0	53.68	51.4
28.3	37.33	41.5	28.5	41.06	53.8	28.0	9.06	56.5	28.0	53.08	51.2
29.3	36.42	41.7	29.5	41.27	54.1	28.9	9.01	56.2	29 0	52.48	50.9
30.3	35.44	41.8	30.5	41.44	54.5	29.9	8.96	55.9	30.0	51.88	50.6
31.3	34.40	42.0	31.5	41.59	54 8	30.9	8.92	55.5	31.0	51.32	50.3
32.3	33.32	42.1	32.5	41.72	55.2	31.9	8.92	55.1	32.0	50.83	50.0

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Piscium. Right Ascension.	33 Piscium. Declination South.	a Andromedæ. Right Ascension.	a Andromedæ. Declination North.	β Cassiopeiæ. Right Ascension.	β Cassiopeiæ. Declination North.	22 Andromedæ. Right Ascension.	22 Andromedæ. Declination North.	γ Pegasi. (Algenib.) Right Ascension.	γ Pegasi. (Algenib.) Declination North.
	h m 0 00	° ' − 6 14	h m 0 03	° ' +28 32	h m 0 03	° ' +58 36	h m 0 05	° ' +45 31	h m 0 08	° ' +14 38
	s	''	s	''	s	''	s	''	s	''
Jan. 0.2	19.64 .11	79.7 0.6	20.00 .15	70.8 1.0	57.90 .32	54.5 0.8	14.49 .21	54.9 0.9	11.99 .12	27.7 0.9
. 10.2	19.53 .11	80.3 0.5	19.85 .13	69.8 1.2	57.58 .30	53.7 1.3	14.28 .20	54.0 1.3	11.87 .12	26.8 1.0
20.2	19.42 .09	80.8 0.4	19.72 .13	68.6 1.4	57.28 .27	52.4 1.8	14.08 .19	52.7 1.7	11.75 .10	25.8 1.0
30.2	19.33 .08	81.2 0.2	19.59 .11	67.2 1.6	57.01 .24	50.6 2.2	13.89 .16	51.0 2.0	11.65 .09	24.8 1.1
Feb. 9.1	19.25 .06	81.4 0.1	19.48 .08	65.6 1.7	56.77 .19	48.4 2.5	13.73 .12	49.0 2.2	11.56 .07	23.7 1.1
19.1	19.19 .03	81.5 0.2	19.40 .05	63.9 1.7	56.58 .14	45.9 2.7	13.61 .08	46.8 2.3	11.49 .05	22.6 1.0
Mar. 1.1	19.16 .01	81.3 0.3	19.35 .01	62.2 1.6	56.44 .06	43.2 2.7	13.53 .04	44.5 2.4	11.44 .01	21.6 0.8
11.0	19.15 .03	81.0 0.6	19.34 .02	60.6 1.5	56.38 .01	40.5 2.8	13.49 .02	42.1 2.2	11.43 .02	20.8 0.7
21.0	19.18 .07	80.4 0.9	19.36 .07	59.1 1.2	56.39 .09	37.7 2.6	13.51 .08	39.9 2.1	11.45 .06	20.1 0.7
31.0	19.25 .11	79.5 1.1	19.43 .12	57.9 1.0	56.48 .17	35.1 2.4	13.59 .13	37.8 1.9	11.51 .11	19.7 0.2
Apr. 10.0	19.36 .15	78.4 1.3	19.55 .17	56.9 0.6	56.65 .25	32.7 2.0	13.72 .19	35.9 1.5	11.62 .14	19.5 0.1
19.9	19.51 .18	77.1 1.5	19.72 .20	56.3 0.3	56.90 .31	30.7 1.6	13.91 .25	34.4 1.1	11.76 .19	19.6 0.4
29.9	19.69 .22	75.6 1.7	19.92 .25	56.0 0.1	57.21 .38	29.1 1.2	14.16 .29	33.3 0.6	11.95 .22	20.0 0.8
May 9.9	19.91 .25	73.9 1.8	20.17 .28	56.1 0.5	57.59 .43	27.9 0.7	14.45 .34	32.7 0.2	12.17 .26	20.8 1.1
19.9	20.16 .28	72.1 2.0	20.45 .31	56.6 0.9	58.02 .47	27.2 0.1	14.79 .36	32.5 0.3	12.43 .28	21.9 1.3
29.8	20.44 .29	70.1 2.0	20.76 .33	57.5 1.3	58.49 .50	27.1 0.4	15.15 .39	32.8 0.8	12.71 .30	23.2 1.6
June 8.8	20.73 .31	68.1 2.0	21.09 .33	58.8 1.6	58.99 .50	27.5 0.9	15.54 .40	33.6 1.2	13.01 .32	24.8 1.8
18.8	21.04 .30	66.1 2.0	21.42 .34	60.4 1.8	59.49 .51	28.4 1.4	15.94 .40	34.8 1.6	13.33 .31	26.6 1.9
28.7	21.34 .31	64.1 1.9	21.76 .33	62.2 2.1	60.00 .49	29.8 1.8	16.34 .39	36.4 2.0	13.64 .31	28.5 2.1
July 8.7	21.65 .28	62.2 1.7	22.09 .31	64.3 2.3	60.49 .46	31.6 2.3	16.73 .37	38.4 2.3	13.95 .30	30.6 2.1
18.7	21.93 .27	60.5 1.6	22.40 .29	66.6 2.4	60.95 .42	33.9 2.6	17.10 .34	40.7 2.6	14.25 .27	32.7 2.1
28.7	22.20 .24	58.9 1.3	22.69 .26	69.0 2.4	61.37 .38	36.5 2.9	17.44 .30	43.3 2.7	14.52 .25	34.8 2.1
Aug. 7.6	22.44 .21	57.6 1.0	22.95 .22	71.4 2.5	61.75 .32	39.4 3.1	17.74 .26	46.0 2.7	14.77 .21	36.8 2.0
17.6	22.65 .17	56.6 0.8	23.17 .18	73.9 2.4	62.07 .26	42.5 3.2	18.00 .21	48.9 2.9	14.98 .18	38.8 2.0
27.6	22.82 .13	55.8 0.5	23.35 .15	76.3 2.3	62.33 .21	45.7 3.4	18.21 .17	51.9 3.0	15.16 .14	40.6 1.7
Sept. 6.6	22.95 .09	55.3 0.3	23.50 .10	78.6 2.2	62.54 .13	49.1 3.3	18.38 .11	54.9 2.9	15.30 .10	42.3 1.4
16.5	23.04 .06	55.0 0.0	23.60 .06	80.8 2.0	62.67 .08	52.4 3.3	18.49 .07	57.8 2.9	15.40 .06	43.7 1.3
26.5	23.10 .02	55.0 0.3	23.66 .02	82.8 1.8	62.75 .01	55.7 3.2	18.56 .02	60.7 2.7	15.46 .03	45.0 1.0
Oct. 6.5	23.12 .02	55.3 0.4	23.68 .01	84.6 1.6	62.76 .05	58.9 3.0	18.58 .02	63.4 2.4	15.49 .00	46.0 0.7
16.4	23.10 .04	55.7 0.6	23.67 .04	86.2 1.3	62.71 .10	61.9 2.8	18.56 .06	65.8 2.2	15.49 .03	46.7 0.6
26.4	23.06 .07	56.3 0.7	23.63 .07	87.5 1.1	62.61 .15	64.7 2.4	18.50 .10	68.0 1.9	15.46 .06	47.3 0.3
Nov. 5.4	22.99 .08	57.0 0.8	23.56 .10	88.6 1.1	62.46 .20	67.1 2.4	18.40 .13	69.9 1.9	15.40 .08	47.6 0.1
15.4	22.91 .10	57.8 0.9	23.46 .11	89.3 0.7	62.26 .24	69.1 2.0	18.27 .16	71.4 1.5	15.32 .10	47.7 0.1
25.3	22.81 .11	58.7 0.8	23.35 .13	89.7 0.4	62.02 .27	70.7 1.6	18.11 .18	72.5 1.1	15.22 .10	47.0 0.1
Dec. 5.3	22.70 .12	59.5 0.8	23.22 .14	89.9 0.2	61.75 .30	71.9 1.2	17.93 .20	73.2 0.7	15.12 .10	47.3 0.3
15.3	22.58 .12	60.3 0.8	23.08 .15	89.6 0.5	61.45 .31	72.5 0.0	17.73 .21	73.5 0.2	15.00 .13	46.8 0.6
25.3	22.46 .12	61.1 0.8	22.93 .14	89.1 0.8	61.14 .32	72.5 0.5	17.52 .21	73.3 0.7	14.87 .13	46.2 0.8
35.2	22.34	61.8 0.7	22.79 .14	88.3 0.8	60.82	72.0 0.5	17.31	72.6 0.7	14.75 .12	45.4

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	σ Andromedæ Right Ascension	σ Andromedæ Declination North	ι Ceti Right Ascension	ι Ceti Declination South	44 Piscium Right Ascension	44 Piscium Declination North	β Hydri Right Ascension	β Hydri Declination South	12 Ceti Right Ascension	12 Ceti Declination South
	h m	° '	h m	° '	h m	° '	h m	° '	h m	° '
	0 13	+36 14	0 14	− 9 21	0 20	+1 23	0 20	−77 47	0 25	−4 29
	s	"	s	"	s	"	s	"	s	"
Jan. 0.2	13.30 (.17)	46.0 (0.9)	26.61 (.12)	62.2 (0.6)	23.37 (.12)	52.2 (0.7)	34.36 (.92)	98.5 (1.0)	2.88 (.12)	54.6 (0.7)
10.2	13.13 (.16)	45.1 (1.2)	26.49 (.11)	62.8 (0.5)	23.25 (.11)	51.5 (0.7)	33.44 (.87)	97.5 (1.6)	2.76 (.11)	55.3 (0.6)
20.2	12.97 (.16)	43.9 (1.5)	26.38 (.11)	63.3 (0.3)	23.14 (.11)	50.8 (0.7)	32.57 (.78)	95.9 (2.1)	2.65 (.11)	55.9 (0.4)
30.2	12.81 (.13)	42.4 (1.7)	26.27 (.09)	63.6 (0.1)	23.03 (.09)	50.1 (0.5)	31.79 (.68)	93.8 (2.6)	2.54 (.10)	56.3 (0.3)
Feb. 9.1	12.68 (.11)	40.7 (1.9)	26.18 (.07)	63.7 (0.1)	22.94 (.08)	49.6 (0.5)	31.11 (.56)	91.2 (3.0)	2.44 (.08)	56.6 (0.2)
19.1	12.57 (.07)	38.8 (2.0)	26.11 (.04)	63.6 (0.4)	22.86 (.05)	49.1 (0.2)	30.55 (.43)	88.2 (3.3)	2.36 (.05)	56.8 (0.1)
Mar. 1.1	12.50 (.03)	36.8 (1.9)	26.07 (.02)	63.2 (0.5)	22.81 (.02)	48.9 (0.1)	30.12 (.28)	84.9 (3.6)	2.31 (.03)	56.7 (0.2)
11.1	12.47 (.01)	34.9 (1.9)	26.05 (.02)	62.7 (0.8)	22.79 (.01)	48.8 (0.1)	29.84 (.13)	81.3 (3.7)	2.28 (.01)	56.5 (0.5)
21.0	12.48 (.06)	33.0 (1.6)	26.07 (.05)	61.9 (1.0)	22.80 (.05)	48.9 (0.3)	29.71 (.03)	77.6 (3.8)	2.29 (.04)	56.0 (0.7)
31.0	12.54 (.12)	31.4 (1.4)	26.12 (.09)	60.9 (1.2)	22.85 (.09)	49.2 (0.6)	29.74 (.18)	73.8 (3.8)	2.33 (.08)	55.3 (1.0)
Apr. 10.0	12.66 (.16)	30.0 (1.1)	26.21 (.13)	59.7 (1.5)	22.94 (.13)	49.8 (0.9)	29.92 (.34)	70.0 (3.6)	2.41 (.13)	54.3 (1.2)
19.9	12.82 (.21)	28.9 (0.7)	26.34 (.18)	58.2 (1.7)	23.07 (.16)	50.7 (1.1)	30.26 (.49)	66.4 (3.5)	2.54 (.16)	53.1 (1.4)
29.9	13.03 (.26)	28.2 (0.3)	26.52 (.21)	56.5 (1.8)	23.23 (.21)	51.8 (1.4)	30.75 (.63)	62.9 (3.3)	2.70 (.20)	51.7 (1.6)
May 9.9	13.29 (.29)	27.9 (0.1)	26.73 (.24)	54.7 (2.0)	23.44 (.24)	53.2 (1.5)	31.38 (.76)	59.6 (3.0)	2.90 (.23)	50.1 (1.8)
19.9	13.58 (.33)	28.0 (0.6)	26.97 (.27)	52.7 (2.0)	23.68 (.27)	54.7 (1.8)	32.14 (.87)	56.6 (2.5)	3.13 (.27)	48.3 (1.9)
29.8	13.91 (.34)	28.6 (1.0)	27.24 (.29)	50.7 (2.1)	23.95 (.29)	56.5 (1.8)	33.01 (.96)	54.1 (2.2)	3.40 (.28)	46.4 (2.0)
June 8.8	14.25 (.36)	29.6 (1.3)	27.53 (.30)	48.6 (2.1)	24.24 (.30)	58.3 (2.0)	33.97 (1.03)	51.9 (1.6)	3.68 (.30)	44.4 (2.0)
18.8	14.61 (.36)	30.9 (1.7)	27.83 (.31)	46.5 (2.0)	24.54 (.30)	60.3 (2.0)	35.00 (1.07)	50.3 (1.1)	3.98 (.31)	42.4 (2.0)
28.8	14.97 (.35)	32.6 (2.0)	28.14 (.31)	44.5 (1.8)	24.84 (.31)	62.3 (1.9)	36.07 (1.08)	49.2 (0.5)	4.29 (.30)	40.4 (2.0)
July 8.7	15.32 (.34)	34.6 (2.2)	28.45 (.29)	42.7 (1.7)	25.15 (.29)	64.2 (1.9)	37.15 (1.06)	48.7 (0.0)	4.59 (.30)	38.4 (1.8)
18.7	15.66 (.31)	36.8 (2.5)	28.74 (.27)	41.0 (1.5)	25.44 (.28)	66.1 (1.8)	38.21 (1.02)	48.7 (0.6)	4.89 (.28)	36.6 (1.6)
28.7	15.97 (.28)	39.3 (2.5)	29.01 (.25)	39.5 (1.2)	25.72 (.24)	67.9 (1.6)	39.23 (.94)	49.3 (1.2)	5.17 (.25)	35.0 (1.4)
Aug. 7.6	16.25 (.25)	41.8 (2.7)	29.26 (.22)	38.3 (0.9)	25.96 (.22)	69.5 (1.4)	40.17 (.83)	50.5 (1.7)	5.42 (.22)	33.6 (1.1)
17.6	16.50 (.20)	44.5 (2.6)	29.48 (.19)	37.4 (0.6)	26.18 (.19)	70.9 (1.2)	41.00 (.70)	52.2 (2.2)	5.64 (.19)	32.5 (0.9)
27.6	16.70 (.16)	47.1 (2.7)	29.67 (.14)	36.8 (0.4)	26.37 (.15)	72.1 (0.9)	41.70 (.54)	54.4 (2.5)	5.83 (.16)	31.6 (0.7)
Sept. 6.6	16.86 (.12)	49.8 (2.5)	29.81 (.11)	36.4 (0.1)	26.52 (.11)	73.0 (0.7)	42.24 (.36)	56.9 (2.9)	5.99 (.12)	30.9 (0.3)
16.5	16.98 (.07)	52.3 (2.4)	29.92 (.07)	36.3 (0.2)	26.63 (.08)	73.7 (0.5)	42.60 (.18)	59.8 (3.0)	6.11 (.08)	30.6 (0.1)
26.5	17.05 (.04)	54.7 (2.2)	29.99 (.03)	36.5 (0.5)	26.71 (.04)	74.2 (0.2)	42.78 (.01)	62.8 (3.1)	6.19 (.04)	30.5 (0.2)
Oct. 6.5	17.09 (.01)	56.9 (2.0)	30.02 (.00)	37.0 (0.6)	26.75 (.01)	74.4 (0.0)	42.77 (.20)	65.9 (3.1)	6.23 (.01)	30.7 (0.3)
16.5	17.08 (.04)	58.9 (1.8)	30.02 (.03)	37.6 (0.8)	26.76 (.03)	74.4 (0.2)	42.57 (.38)	69.0 (3.0)	6.24 (.02)	31.0 (0.6)
26.4	17.04 (.07)	60.7 (1.4)	29.99 (.06)	38.4 (0.9)	26.73 (.04)	74.2 (0.4)	42.19 (.54)	72.0 (2.6)	6.22 (.04)	31.6 (0.7)
Nov. 5.4	16.97 (.10)	62.1 (1.2)	29.93 (.07)	39.3 (1.0)	26.69 (.07)	73.8 (0.5)	41.65 (.68)	74.6 (2.3)	6.18 (.07)	32.3 (0.7)
15.4	16.87 (.12)	63.3 (0.8)	29.86 (.10)	40.3 (1.0)	26.62 (.09)	73.3 (0.6)	40.97 (.80)	76.9 (1.8)	6.11 (.08)	33.0 (0.9)
25.3	16.75 (.14)	64.1 (0.4)	29.76 (.11)	41.3 (0.9)	26.63 (.10)	72.7 (0.7)	40.17 (.88)	78.7 (1.3)	6.03 (.10)	33.9 (0.8)
Dec. 5.3	16.61 (.15)	64.5 (0.1)	29.65 (.11)	42.2 (0.9)	26.43 (.11)	72.0 (0.7)	39.29 (.93)	80.0 (0.6)	5.93 (.11)	34.7 (0.9)
15.3	16.46 (.17)	64.6 (0.3)	29.54 (.12)	43.1 (0.8)	26.32 (.11)	71.3 (0.8)	38.36 (.95)	80.6 (0.1)	5.82 (.12)	35.6 (0.8)
25.3	16.29 (.17)	64.3 (0.7)	29.42 (.12)	43.9 (0.7)	26.21 (.12)	70.5 (0.8)	37.41 (.93)	80.7 (0.6)	5.70 (.12)	36.4 (0.7)
35.2	16.12	63.6	29.30	44.6	26.09	69.7	36.48	80.1	5.58	37.1

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π Andromedæ. Right Ascension.	π Andromedæ. Declination North.	a Cassiopeiæ. Right Ascension.	a Cassiopeiæ. Declination orth.	β Ceti. Right Ascension.	β Ceti. Declination South.	21 Cassiopeiæ. Right Ascension.	21 Cassiopeiæ. Declination North.	o Cassiopeiæ. Right Ascension.	o Cassiopeiæ. Declination North.
	h m 0 31	° ′ +33 10	h m 0 34	° ′ +55 59	h m 0 38	° ′ −18 31	h m 0 39	° ′ +74 27	h m 0 39	° ′ +47 44
	s	″	s	″	s	″	s	″	s	″
Jan. 0.3	39.72 (.16)	61.4 (0.8)	58.04 (.29)	79.4 (0.4)	40.81 (.13)	32.2 (0.6)	12.84 (.71)	31.5 (0.1)	17.04 (.22)	70.7 (0.5)
10.2	39.56 (.16)	60.6 (1.1)	57.75 (.29)	79.0 (1.0)	40.68 (.13)	32.8 (0.3)	12.13 (.70)	31.4 (0.7)	16.82 (.23)	70.2 (1.0)
20.2	39.40 (.15)	59.5 (1.3)	57.46 (.27)	78.0 (1.5)	40.55 (.13)	33.1 (0.0)	11.43 (.68)	30.7 (1.2)	16.59 (.21)	69.2 (1.4)
30.2	39.25 (.14)	58.2 (1.5)	57.19 (.25)	76.5 (1.8)	40.42 (.11)	33.1 (0.2)	10.75 (.61)	29.5 (1.8)	16.38 (.20)	67.8 (1.7)
Feb. 9.1	39.11 (.11)	56.7 (1.7)	56.94 (.21)	74.7 (2.2)	40.31 (.10)	32.9 (0.5)	10.14 (.53)	27.7 (2.3)	16.18 (.17)	66.1 (2.0)
19.1	39.00 (.09)	55.0 (1.8)	56.73 (.16)	72.5 (2.4)	40.21 (.07)	32.4 (0.8)	9.61 (.42)	25.4 (2.6)	16.01 (.13)	64.1 (2.2)
Mar. 1.1	38.91 (.05)	53.2 (1.8)	56.57 (.11)	70.1 (2.6)	40.14 (.05)	31.6 (1.1)	9.19 (.29)	22.8 (2.9)	15.88 (.08)	61.9 (2.3)
11.1	38.86 (.00)	51.4 (1.6)	56.46 (.04)	67.5 (2.6)	40.09 (.01)	30.5 (1.3)	8.90 (.15)	19.9 (3.0)	15.80 (.03)	59.6 (2.3)
21.0	38.86 (.04)	49.8 (1.5)	56.42 (.03)	64.9 (2.5)	40.08 (.03)	29.2 (1.5)	8.75 (.01)	16.9 (3.0)	15.77 (.03)	57.3 (2.2)
31.0	38.90 (.09)	48.3 (1.3)	56.45 (.11)	62.4 (2.4)	40.11 (.06)	27.7 (1.8)	8.76 (.16)	13.9 (3.0)	15.80 (.09)	55.1 (2.0)
Apr. 10.0	38.99 (.13)	47.0 (1.0)	56.56 (.19)	60.0 (2.1)	40.17 (.11)	25.9 (1.9)	8.92 (.31)	10.9 (2.7)	15.89 (.15)	53.1 (1.8)
20.0	39.12 (.19)	46.0 (0.6)	56.75 (.25)	57.9 (1.7)	40.28 (.15)	24.0 (2.1)	9.23 (.46)	8.2 (2.4)	16.04 (.21)	51.3 (1.4)
29.9	39.31 (.24)	45.4 (0.3)	57.00 (.32)	56.2 (1.3)	40.43 (.19)	21.9 (2.3)	9.69 (.58)	5.8 (2.0)	16.25 (.27)	49.9 (1.0)
May 9.9	39.55 (.27)	45.1 (0.2)	57.32 (.37)	54.9 (0.9)	40.62 (.23)	19.6 (2.3)	10.27 (.69)	3.8 (1.6)	16.52 (.32)	48.9 (0.5)
19.9	39.82 (.30)	45.3 (0.5)	57.69 (.42)	54.0 (0.4)	40.85 (.26)	17.3 (2.3)	10.96 (.78)	2.2 (1.0)	16.84 (.36)	48.4 (0.1)
29.8	40.12 (.33)	45.8 (0.9)	58.11 (.46)	53.6 (0.1)	41.11 (.29)	15.0 (2.3)	11.74 (.85)	1.2 (0.5)	17.20 (.39)	48.3 (0.3)
June 8.8	40.45 (.35)	46.7 (1.3)	58.57 (.47)	53.7 (0.7)	41.40 (.30)	12.7 (2.2)	12.59 (.88)	0.7 (0.1)	17.59 (.41)	48.6 (0.8)
18.8	40.80 (.35)	48.0 (1.6)	59.04 (.48)	54.4 (1.1)	41.70 (.32)	10.5 (2.0)	13.47 (.90)	0.8 (0.5)	18.00 (.41)	49.4 (1.2)
28.8	41.15 (.35)	49.6 (1.9)	59.52 (.48)	55.5 (1.5)	42.02 (.31)	8.5 (1.9)	14.37 (.90)	1.3 (1.2)	18.41 (.42)	50.6 (1.7)
July 8.7	41.50 (.34)	51.5 (2.1)	60.00 (.46)	57.0 (2.0)	42.33 (.31)	6.6 (1.6)	15.27 (.86)	2.5 (1.6)	18.83 (.40)	52.3 (1.9)
18.7	41.84 (.31)	53.6 (2.2)	60.46 (.43)	59.0 (2.3)	42.64 (.29)	5.0 (1.2)	16.13 (.81)	4.1 (2.1)	19.23 (.37)	54.2 (2.3)
28.7	42.15 (.29)	55.8 (2.4)	60.89 (.39)	61.3 (2.6)	42.93 (.28)	3.8 (1.0)	16.94 (.75)	6.2 (2.5)	19.60 (.35)	56.5 (2.6)
Aug. 7.7	42.44 (.25)	58.2 (2.4)	61.28 (.35)	63.9 (2.8)	43.21 (.24)	2.8 (0.6)	17.69 (.66)	8.7 (2.8)	19.95 (.31)	59.1 (2.7)
17.6	42.69 (.22)	60.7 (2.5)	61.63 (.30)	66.7 (3.0)	43.45 (.21)	2.2 (0.2)	18.35 (.57)	11.5 (3.2)	20.26 (.26)	61.8 (2.8)
27.6	42.91 (.18)	63.2 (2.4)	61.93 (.25)	69.7 (3.2)	43.66 (.17)	2.0 (0.1)	18.92 (.46)	14.7 (3.3)	20.52 (.22)	64.6 (2.9)
Sept. 6.6	43.09 (.14)	65.6 (2.4)	62.18 (.18)	72.9 (3.2)	43.83 (.13)	2.1 (0.4)	19.38 (.36)	18.0 (3.6)	20.74 (.17)	67.5 (2.9)
16.5	43.23 (.10)	68.0 (2.2)	62.36 (.13)	76.1 (3.1)	43.96 (.10)	2.5 (0.7)	19.74 (.24)	21.6 (3.6)	20.91 (.12)	70.4 (2.9)
26.5	43.33 (.06)	70.2 (2.1)	62.49 (.08)	79.2 (3.1)	44.06 (.06)	3.2 (1.0)	19.98 (.12)	25.2 (3.6)	21.03 (.08)	73.3 (2.7)
Oct. 6.5	43.39 (.02)	72.3 (1.8)	62.57 (.01)	82.3 (3.0)	44.12 (.02)	4.2 (1.2)	20.10 (.00)	28.8 (3.5)	21.11 (.03)	76.0 (2.6)
16.5	43.41 (.02)	74.1 (1.7)	62.58 (.03)	85.3 (2.7)	44.14 (.02)	5.4 (1.4)	20.10 (.12)	32.3 (3.4)	21.14 (.02)	78.6 (2.4)
26.4	43.39 (.04)	75.8 (1.3)	62.55 (.09)	88.0 (2.5)	44.12 (.04)	6.8 (1.4)	19.98 (.23)	35.7 (3.2)	21.12 (.06)	81.0 (2.2)
Nov. 5.4	43.35 (.08)	77.1 (1.1)	62.46 (.14)	90.5 (2.2)	44.08 (.07)	8.2 (1.4)	19.75 (.34)	38.9 (2.9)	21.06 (.09)	83.2 (1.8)
15.4	43.27 (.10)	78.2 (0.8)	62.32 (.17)	92.7 (1.7)	44.01 (.08)	9.6 (1.3)	19.41 (.44)	41.8 (2.5)	20.97 (.13)	85.0 (1.4)
25.4	43.17 (.12)	79.0 (0.4)	62.15 (.22)	94.4 (1.4)	43.93 (.11)	10.9 (1.3)	18.97 (.54)	44.3 (2.0)	20.84 (.16)	86.4 (1.1)
Dec. 5.3	43.05 (.14)	79.4 (0.1)	61.93 (.24)	95.8 (0.8)	43.82 (.12)	12.2 (1.1)	18.43 (.60)	46.3 (1.5)	20.68 (.19)	87.5 (0.6)
15.3	42.91 (.15)	79.5	61.69 (.27)	96.6 (0.4)	43.70 (.13)	13.3 (0.9)	17.83 (.67)	47.8 (0.9)	20.49 (.21)	88.1 (0.2)
25.3	42.76 (.16)	79.3 (0.6)	61.42 (.29)	97.0 (0.2)	43.57 (.13)	14.2 (0.7)	17.16 (.71)	48.7 (0.9)	20.28 (.22)	88.3 (0.3)
35.2	42.60	78.7	61.13	96.8 (0.2)	43.44	14.9 (0.7)	16.45 (.71)	49.0 (0.3)	20.06	88.0 (0.3)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Piscium. Right Ascension.	δ Piscium. Declination North.	γ Cassiopeiæ. Right Ascension.	γ Cassiopeiæ. Declination North.	μ Andromedæ. Right Ascension.	μ Andromedæ. Declination North.	43 Cephei (H.). Right Ascension.	43 Cephei (H.). Declination North.	ε Piscium. Right Ascension.	ε Piscium. Declination North.
	h m — 0 43	° ′ + 7 03	h m — 0 50	° ′ +60 11	h m — 0 51	° ′ +37 58	h m — 0 55	° ′ +85 43	h m — 0 57	° ′ + 7 21
	s	″	s	″	s	″	s	″	s	″
Jan. 0.3	36.66 (.12)	10.8 (0.8)	49.20 (.33)	30.0 (0.2)	19.95 (.18)	18.6 (0.5)	26.14 (2.79)	76.6 (0.4)	52.30 (.13)	49.2 (0.7)
10.2	36.54 (.12)	10.0 (0.8)	48.87 (.34)	29.8 (0.7)	19.77 (.18)	18.1 (0.9)	23.35 (2.80)	77.0 (0.2)	52.17 (.12)	48.5 (0.8)
20.2	36.42 (.12)	9.2 (0.8)	48.53 (.33)	29.1 (1.3)	19.59 (.17)	17.2 (1.2)	20.55 (2.71)	76.8 (0.9)	52.05 (.13)	47.7 (0.7)
30.2	36.30 (.11)	8.5 (0.7)	48.20 (.30)	27.8 (1.7)	19.42 (.16)	16.0 (1.5)	17.84 (2.51)	75.9 (1.4)	51.92 (.11)	47.0 (0.8)
Feb. 9.2	36.19 (.09)	7.7 (0.8)	47.90 (.27)	26.1 (2.1)	19.26 (.15)	14.5 (1.7)	15.33 (2.21)	74.5 (2.1)	51.81 (.11)	46.2 (0.6)
19.1	36.10 (.07)	7.1 (0.6)	47.63 (.22)	24.0 (2.4)	19.11 (.11)	12.8 (1.9)	13.12 (1.82)	72.4 (2.4)	51.70 (.08)	45.6 (0.6)
Mar. 1.1	36.03 (.05)	6.5 (0.4)	47.41 (.15)	21.6 (2.5)	19.00 (.08)	10.9 (1.8)	11.30 (1.36)	70.0 (2.8)	51.62 (.06)	45.0 (0.4)
11.1	35.98 (.01)	6.1 (0.2)	47.26 (.08)	19.1 (2.7)	18.92 (.03)	9.1 (1.9)	9.94 (0.84)	67.2 (3.1)	51.56 (.03)	44.6 (0.2)
21.0	35.97 (.03)	5.9 (0.0)	47.18 (.01)	16.4 (2.7)	18.89 (.01)	7.2 (1.7)	9.10 (0.30)	64.1 (3.1)	51.53 (.02)	44.4 (0.0)
31.0	36.00 (.06)	5.9 (0.2)	47.19 (.08)	13.7 (2.5)	18.90 (.07)	5.5 (1.6)	8.80 (.26)	61.0 (3.2)	51.55 (.05)	44.4 (0.2)
Apr. 10.0	36.06 (.11)	6.1 (0.5)	47.27 (.17)	11.2 (2.3)	18.97 (.13)	3.9 (1.3)	9.06 (0.79)	57.8 (3.0)	51.60 (.09)	44.6 (0.5)
20.0	36.17 (.15)	6.6 (0.8)	47.44 (.26)	8.9 (2.0)	19.10 (.17)	2.6 (1.0)	9.85 (1.30)	54.8 (2.8)	51.69 (.14)	45.1 (0.7)
29.9	36.32 (.19)	7.4 (1.0)	47.70 (.32)	6.9 (1.6)	19.27 (.23)	1.6 (0.6)	11.15 (1.77)	52.0 (2.4)	51.83 (.18)	45.8 (1.0)
May 9.9	36.51 (.23)	8.4 (1.3)	48.02 (.40)	5.3 (1.2)	19.50 (.27)	1.0 (0.2)	12.92 (2.16)	49.6 (2.0)	52.01 (.21)	46.8 (1.2)
19.9	36.74 (.26)	9.7 (1.5)	48.42 (.44)	4.1 (0.7)	19.77 (.31)	0.8 (0.2)	15.08 (2.50)	47.6 (1.5)	52.22 (.25)	48.0 (1.4)
29.9	37.00 (.28)	11.2 (1.7)	48.86 (.49)	3.4 (0.2)	20.08 (.34)	1.0 (0.6)	17.58 (2.74)	46.1 (1.0)	52.47 (.28)	49.4 (1.7)
June 8.8	37.28 (.30)	12.9 (1.8)	49.35 (.52)	3.2 (0.3)	20.42 (.35)	1.6 (1.0)	20.32 (2.90)	45.1 (0.5)	52.75 (.29)	51.1 (1.8)
18.8	37.58 (.30)	14.7 (1.9)	49.87 (.53)	3.5 (0.8)	20.77 (.37)	2.6 (1.3)	23.22 (3.00)	44.6 (0.1)	53.04 (.31)	52.9 (1.8)
28.8	37.88 (.31)	16.6 (2.0)	50.40 (.53)	4.3 (1.3)	21.14 (.37)	3.9 (1.7)	26.22 (3.00)	44.7 (0.7)	53.35 (.31)	54.7 (1.9)
July 8.7	38.19 (.30)	18.6 (1.9)	50.93 (.52)	5.6 (1.7)	21.51 (.36)	5.6 (1.9)	29.23 (2.94)	45.4 (1.1)	53.66 (.30)	56.6 (1.9)
18.7	38.49 (.29)	20.5 (1.9)	51.45 (.49)	7.3 (2.1)	21.87 (.34)	7.5 (2.2)	32.17 (2.81)	46.5 (1.7)	53.96 (.29)	58.5 (1.9)
28.7	38.78 (.26)	22.4 (1.7)	51.94 (.45)	9.4 (2.4)	22.21 (.32)	9.7 (2.3)	34.98 (2.62)	48.2 (2.2)	54.25 (.27)	60.4 (1.8)
Aug. 7.7	39.04 (.24)	24.1 (1.7)	52.39 (.41)	11.8 (2.8)	22.53 (.28)	12.0 (2.5)	37.60 (2.38)	50.4 (2.6)	54.52 (.25)	62.2 (1.6)
17.6	39.28 (.20)	25.8 (1.4)	52.80 (.35)	14.6 (2.9)	22.81 (.25)	14.5 (2.5)	39.98 (2.07)	53.0 (2.9)	54.77 (.21)	63.8 (1.4)
27.6	39.48 (.17)	27.2 (1.2)	53.15 (.30)	17.5 (3.2)	23.06 (.21)	17.0 (2.5)	42.05 (1.74)	55.9 (3.2)	54.98 (.18)	65.2 (1.2)
Sept. 6.6	39.65 (.14)	28.4 (1.0)	53.45 (.24)	20.7 (3.2)	23.27 (.17)	19.5 (2.5)	43.79 (1.38)	59.1 (3.5)	55.16 (.15)	66.4 (1.0)
16.5	39.79 (.10)	29.4 (0.8)	53.69 (.17)	23.9 (3.2)	23.44 (.13)	22.0 (2.3)	45.17 (0.98)	62.6 (3.7)	55.31 (.12)	67.4 (0.8)
26.5	39.89 (.07)	30.2 (0.5)	53.86 (.11)	27.1 (3.2)	23.57 (.08)	24.4 (2.3)	46.15 (.55)	66.3 (3.7)	55.43 (.08)	68.2 (0.5)
Oct. 6.5	39.96 (.03)	30.7 (0.3)	53.97 (.05)	30.3 (3.2)	23.65 (.05)	26.7 (2.1)	46.70 (.12)	70.0 (3.8)	55.51 (.04)	68.7 (0.4)
16.5	39.99 (.00)	31.0 (0.1)	54.02 (.01)	33.5 (2.9)	23.70 (.01)	28.8 (1.9)	46.82 (.33)	73.8 (3.6)	55.55 (.02)	69.1 (0.1)
26.5	39.99 (.02)	31.1 (0.1)	54.01 (.07)	36.4 (2.8)	23.71 (.03)	30.7 (1.7)	46.49 (0.78)	77.4 (3.5)	55.57 (.01)	69.2 (0.1)
Nov. 5.4	39.97 (.05)	31.0 (0.2)	53.94 (.13)	39.2 (2.4)	23.68 (.06)	32.4 (1.4)	45.71 (1.21)	80.9 (3.3)	55.56 (.04)	69.1 (0.2)
15.4	39.92 (.07)	30.8 (0.4)	53.81 (.18)	41.6 (2.0)	23.62 (.09)	33.8 (1.1)	44.50 (1.62)	84.2 (3.0)	55.52 (.06)	68.9 (0.4)
25.4	39.85 (.09)	30.4 (0.5)	53.63 (.24)	43.6 (1.7)	23.53 (.11)	34.9 (0.8)	42.88 (2.00)	87.2 (2.5)	55.46 (.08)	68.5 (0.5)
Dec. 5.3	39.76 (.10)	29.9 (0.6)	53.39 (.27)	45.3 (1.1)	23.42 (.14)	35.7 (0.4)	40.88 (2.32)	89.7 (2.0)	55.38 (.09)	68.0 (0.6)
15.3	39.66 (.11)	29.3 (0.7)	53.12 (.30)	46.4 (0.7)	23.28 (.16)	36.1 (0.0)	38.56 (2.57)	91.7 (1.4)	55.29 (.11)	67.4 (0.6)
25.3	39.55 (.12)	28.6 (0.7)	52.82 (.33)	47.1 (0.1)	23.12 (.17)	36.1 (0.3)	35.99 (2.76)	93.1 (0.9)	55.18 (.12)	66.8 (0.8)
35.3	39.43	27.9	52.49	47.2	22.95	35.8	33.23	94.0	55.06	66.0

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Andromedæ. Right Ascension.	Declination North.	κ Tucanæ. Right Ascension.	Declination South.	f Piscium. Right Ascension.	Declination North.	θ¹ Ceti. Right Ascension.	Declination South.	38 Cassiopeiæ. Right Ascension.	Declination North.
	h m $\quad$ 1 04	° ′ $\quad$ +35 06	h m $\quad$ 1 12	° ′ $\quad$ −69 23	h m $\quad$ 1 12	° ′ $\quad$ + 3 05	h m $\quad$ 1 19	° ′ $\quad$ − 8 40	h m $\quad$ 1 23	° ′ $\quad$ +69 45
	s	″	s	″	s	″	s	″	s	″
Jan. 0.3	15.85 .16	16.8 0.5	26.51 .56	65.5 0.0	45.58 .12	56.3 0.7	8.37 .12	82.8 0.8	58.83 .50	57.5 0.4
10.2	15.69 .17	16.3 0.8	25.95 .55	65.5 0.7	45.46 .13	55.6 0.7	8.25 .14	83.6 0.6	58.33 .53	57.9 0.2
20.2	15.52 .17	15.5 1.1	25.40 .53	64.8 1.2	45.33 .13	54.9 0.7	8.11 .13	84.2 0.4	57.80 .53	57.7 0.7
30.2	15.35 .16	14.4 1.4	24.87 .50	63.6 1.7	45.20 .12	54.2 0.6	7.98 .13	84.6 0.2	57.27 .51	57.0 1.3
Feb. 9.2	15.19 .15	13.0 1.5	24.37 .44	61.9 2.3	45.08 .11	53.6 0.4	7.85 .12	84.8 0.1	56.76 .46	55.7 1.8
19.1	15.04 .12	11.5 1.7	23.93 .38	59.6 2.7	44.97 .10	53.2 0.4	7.73 .10	84.9 0.2	56.30 .40	53.9 2.2
Mar. 1.1	14.92 .08	9.8 1.7	23.55 .31	56.9 3.0	44.87 .07	52.8 0.2	7.63 .08	84.7 0.4	55.90 .32	51.7 2.5
11.1	14.84 .05	8.1 1.7	23.24 .23	53.9 3.4	44.80 .04	52.6 0.1	7.55 .05	84.3 0.4	55.58 .22	49.2 2.8
21.0	14.79 .00	6.4 1.6	23.01 .13	50.5 3.5	44.76 .00	52.7 0.2	7.50 .01	83.6 0.9	55.36 .10	46.4 2.8
31.0	14.79 .06	4.8 1.4	22.88 .04	47.0 3.7	44.76 .03	52.9 0.4	7.49 .02	82.7 1.2	55.26 .01	43.6 2.9
Apr. 10.0	14.85 .10	3.4 1.2	22.84 .06	43.3 3.7	44.79 .08	53.3 0.7	7.51 .07	81.5 1.4	55.27 .14	40.7 2.7
20.0	14.95 .16	2.2 0.9	22.90 .17	39.6 3.7	44.87 .12	54.0 1.0	7.58 .11	80.1 1.6	55.41 .26	38.0 2.5
29.9	15.11 .21	1.3 0.5	23.07 .26	35.9 3.5	44.99 .16	55.0 1.2	7.69 .16	78.5 1.7	55.67 .37	35.5 2.2
May 9.9	15.32 .25	0.8 0.2	23.33 .35	32.4 3.4	45.15 .21	56.2 1.4	7.85 .19	76.8 2.0	56.04 .47	33.3 1.8
19.9	15.57 .29	0.6 0.2	23.68 .44	29.0 3.1	45.36 .23	57.6 1.5	8.04 .23	74.8 2.0	56.51 .56	31.5 1.4
29.9	15.86 .32	0.8 0.6	24.12 .52	25.9 2.8	45.59 .27	59.1 1.8	8.27 .26	72.8 2.1	57.07 .63	30.1 0.9
June 8.8	16.18 .35	1.4 1.0	24.64 .58	23.1 2.3	45.86 .28	60.9 1.8	8.53 .28	70.7 2.1	57.70 .69	29.2 0.4
18.8	16.53 .35	2.4 1.2	25.22 .62	20.8 1.9	46.14 .30	62.7 1.9	8.81 .30	68.6 2.1	58.39 .71	28.8 0.1
28.8	16.88 .36	3.6 1.6	25.84 .66	18.9 1.3	46.44 .31	64.6 1.9	9.11 .30	66.5 2.0	59.10 .73	28.9 0.6
July 8.8	17.24 .36	5.2 1.9	26.50 .67	17.6 0.8	46.75 .30	66.5 1.9	9.41 .30	64.5 1.8	59.83 .73	29.5 1.1
18.7	17.60 .33	7.1 2.0	27.17 .66	16.8 0.3	47.05 .30	68.4 1.8	9.71 .30	62.7 1.6	60.56 .70	30.6 1.6
28.7	17.93 .32	9.1 2.2	27.83 .64	16.5 0.4	47.35 .27	70.2 1.6	10.01 .28	61.1 1.3	61.26 .67	32.2 2.0
Aug. 7.7	18.25 .29	11.3 2.3	28.47 .59	16.9 0.9	47.62 .25	71.8 1.5	10.29 .25	59.8 1.1	61.93 .63	34.2 2.4
17.6	18.54 .25	13.6 2.4	29.06 .52	17.8 1.5	47.87 .23	73.3 1.2	10.54 .23	58.7 0.8	62.56 .56	36.6 2.7
27.6	18.79 .22	16.0 2.4	29.58 .44	19.3 2.0	48.10 .19	74.5 1.0	10.77 .20	57.9 0.4	63.12 .49	39.3 3.0
Sept. 6.6	19.01 .18	18.4 2.3	30.02 .36	21.3 2.4	48.29 .16	75.5 0.8	10.97 .17	57.5 0.2	63.61 .41	42.3 3.2
16.6	19.19 .14	20.7 2.2	30.38 .25	23.7 2.8	48.45 .13	76.3 0.5	11.14 .13	57.3 0.2	64.02 .33	45.5 3.3
26.5	19.33 .10	22.9 2.1	30.63 .14	26.5 3.0	48.58 .09	76.8 0.3	11.27 .10	57.5 0.4	64.35 .25	48.8 3.4
Oct. 6.5	19.43 .06	25.0 2.0	30.77 .03	29.5 3.1	48.67 .07	77.1 0.0	11.37 .07	57.9 0.7	64.60 .15	52.2 3.4
16.5	19.49 .03	27.0 1.8	30.80 .08	32.6 3.2	48.74 .03	77.1 0.2	11.44 .03	58.6 0.9	64.75 .06	55.6 3.3
26.5	19.52 .01	28.8 1.5	30.72 .19	35.8 3.0	48.77 .00	76.9 0.3	11 47 .00	59.5 1.0	64.81 .02	58.9 3.2
Nov. 5.4	19.51 .04	30.3 1.3	30.53 .28	38.8 2.8	48.77 .03	76.6 0.4	11.47 .02	60.5 1.1	64.79 .13	62.1 2.9
15.4	19.47 .07	31.6 1.0	30.25 .37	41.6 2.5	48.74 .05	76.2 0.6	11.45 .05	61.6 1.2	64.66 .21	65.0 2.7
25.4	19.40 .10	32.6 0.7	29.88 .43	44.1 2.0	48.69 .07	75.6 0.7	11.40 .08	62.8 1.1	64.45 .29	67.7 2.2
Dec. 5.3	19.30 .12	33.3 0.3	29.45 .50	46.1 1.5	48.62 .08	74.9 0.7	11.32 .09	63.9 1.1	64.16 .37	69.9 1.9
15.3	19.18 .14	33.6 0.1	28.95 .53	47.6 0.9	48.54 .11	74.2 0.8	11.23 .10	65.0 1.0	63.79 .43	71.8 1.3
25.3	19.04 .16	33.7 0.3	28.42 .55	48.5 0.9	48.43 .11	73.4 0.7	11.13 .13	66.0 1.0	63.36 .49	73.1 0.8
35.3	18.88	33.4	27.87	48.9 0.4	48.32	72.7 0.7	11.00	66.9 0.9	62.87	73.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Piscium. Right Ascension.	η Piscium. Declination North.	ν Andromedæ. Right Ascension.	ν Andromedæ. Declination North.	π Piscium. Right Ascension.	π Piscium. Declination North.	α Eridani. (Achernar.) Right Ascension.	α Eridani. (Achernar.) Declination South.	ν Piscium. Right Ascension.	ν Piscium. Declination North.
	h m 1 26	° ′ +14 50	h m 1 31	° ′ +40 54	h m 1 31	° ′ +11 38	h m 1 34	° ′ −57 43	h m 1 36	° ′ +4 59
	s	″	s	″	s	″	s	″	s	″
Jan. 0.3	15.44	32.0	4.19	68.8	55.29	29.2	4.33	80.8	20.96	32.1
10.3	15.32	31.4	4.01	68.6	55.17	28.6	3.99	81.3	20.84	31.4
20.2	15.19	30.7	3.82	68.1	55.04	27.9	3.65	81.2	20.71	30.7
30.2	15.05	29.9	3.62	67.2	54.90	27.1	3.31	80.6	20.58	30.0
Feb. 9.2	14.91	29.0	3.42	66.0	54.77	26.3	2.99	79.4	20.45	29.4
19.2	14.79	28.1	3.24	64.5	54.64	25.6	2.69	77.7	20.32	28.9
Mar. 1.1	14.68	27.3	3.08	62.8	54.53	24.9	2.42	75.6	20.21	28.5
11.1	14.59	26.6	2.95	61.0	54.44	24.3	2.20	73.0	20.12	28.2
21.1	14.54	25.9	2.87	59.1	54.38	23.9	2.03	70.2	20.05	28.1
31.0	14.52	25.5	2.83	57.3	54.36	23.6	1.92	67.0	20.03	28.2
Apr. 10.0	14.54	25.2	2.85	55.6	54.38	23.5	1.87	63.7	20.04	28.5
20.0	14.61	25.2	2.93	54.1	54.44	23.7	1.89	60.2	20.09	29.1
30.0	14.73	25.4	3.07	52.8	54.55	24.1	1.98	56.6	20.19	29.9
May 9.9	14.89	25.9	3.26	51.8	54.70	24.8	2.14	53.1	20.34	30.9
19.9	15.09	26.7	3.50	51.2	54.89	25.7	2.37	49.7	20.52	32.1
29.9	15.33	27.7	3.79	50.9	55.12	26.8	2.66	46.5	20.74	33.6
June 8.9	15.60	28.9	4.12	51.0	55.38	28.2	3.00	43.5	20.99	35.2
18.8	15.89	30.4	4.47	51.5	55.67	29.7	3.40	40.8	21.27	37.0
28.8	16.20	32.0	4.84	52.4	55.97	31.4	3.83	38.6	21.57	38.8
July 8.8	16.51	33.8	5.22	53.6	56.28	33.2	4.29	36.8	21.87	40.6
18.7	16.82	35.6	5.60	55.2	56.59	35.0	4.75	35.5	22.17	42.5
28.7	17.13	37.5	5.97	57.0	56.89	36.8	5.22	34.7	22.47	44.2
Aug. 7.7	17.41	39.3	6.32	59.0	57.18	38.6	5.67	34.6	22.75	45.9
17.7	17.68	41.0	6.65	61.2	57.44	40.3	6.10	34.9	23.02	47.4
27.6	17.92	42.7	6.94	63.5	57.69	41.8	6.49	35.9	23.26	48.7
Sept. 6.6	18.13	44.2	7.21	65.9	57.90	43.1	6.83	37.4	23.47	49.7
16.6	18.31	45.5	7.43	68.3	58.08	44.3	7.11	39.3	23.65	50.5
26.6	18.46	46.7	7.61	70.6	58.23	45.2	7.32	41.7	23.80	51.1
Oct. 6.5	18.57	47.6	7.75	73.0	58.34	46.0	7.47	44.4	23.92	51.5
16.5	18.65	48.3	7.86	75.2	58.43	46.5	7.55	47.3	24.01	51.6
26.5	18.70	48.9	7.92	77.2	58.48	46.9	7.55	50.3	24.06	51.6
Nov. 5.4	18.71	49.3	7.94	79.1	58.50	47.0	7.50	53.3	24.09	51.3
15.4	18.70	49.4	7.93	80.7	58.50	47.0	7.37	56.2	24.08	50.9
25.4	18.67	49.4	7.88	82.1	58.47	46.9	7.19	58.8	24.06	50.4
Dec. 5.4	18.61	49.3	7.79	83.2	58.41	46.6	6.96	61.1	24.01	49.8
15.3	18.53	49.0	7.67	84.0	58.34	46.1	6.69	63.0	23.93	49.1
25.3	18.43	48.5	7.53	84.4	58.24	45.6	6.39	64.4	23.84	48.4
35.3	18.31	47.9	7.36	84.4	58.12	45.0	6.06	65.2	23.73	47.7

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	o Piscium. Right Ascension	o Piscium. Declination North.	ζ Ceti. Right Ascension	ζ Ceti. Declination South.	β Arietis. Right Ascension	β Arietis. Declination North.	50 Cassiopeiæ. Right Ascension	50 Cassiopeiæ. Declination North.	γ Andromedæ. Right Ascension	γ Andromedæ. Declination North.
	h m 1 40	° ' +8 39	h m 1 46	° ' −10 48	h m 1 49	° ' +20 19	h m 1 55	° ' +71 56	h m 1 57	° ' +41 51
	s	"	s	"	s	"	s	"	s	"
Jan. 0.3	14.24	55.3	38.41	72.7	14.85	50.9	7.30	68.3	54.72	46.8
10.3	14.13	54.6	38.29	73.6	14.72	50.4	6.76	69.2	54.55	46.9
20.3	14.00	53.9	38.15	74.3	14.58	49.8	6.17	69.5	54.36	46.6
30.2	13.86	53.2	38.01	74.8	14.43	49.1	5.57	69.2	54.15	46.0
Feb. 9.2	13.72	52.5	37.87	75.0	14.28	48.2	4.96	68.3	53.94	45.0
19.2	13.59	51.8	37.73	75.0	14.14	47.3	4.39	66.9	53.74	43.8
Mar. 1.1	13.48	51.3	37.61	74.8	14.01	46.3	3.88	65.0	53.56	42.3
11.1	13.38	50.9	37.51	74.3	13.90	45.4	3.44	62.8	53.40	40.6
21.1	13.32	50.6	37.43	73.6	13.82	44.5	3.11	60.2	53.29	38.8
31.1	13.29	50.4	37.39	72.6	13.78	43.7	2.90	57.4	53.22	37.0
Apr. 10.0	13.30	50.5	37.38	71.4	13.78	43.1	2.82	54.6	53.20	35.3
20.0	13.35	50.9	37.42	69.9	13.83	42.7	2.88	51.8	53.25	33.7
30.0	13.45	51.4	37.51	68.2	13.93	42.6	3.07	49.1	53.35	32.3
May 9.9	13.59	52.2	37.63	66.3	14.07	42.7	3.39	46.6	53.52	31.1
19.9	13.77	53.3	37.80	64.3	14.26	43.1	3.84	44.5	53.74	30.3
29.9	14.00	54.6	38.01	62.2	14.49	43.7	4.39	42.7	54.01	29.8
June 8.9	14.25	56.0	38.25	60.0	14.75	44.6	5.03	41.4	54.32	29.7
18.8	14.53	57.6	38.52	57.8	15.04	45.8	5.75	40.5	54.66	29.9
28.8	14.83	59.4	38.81	55.7	15.35	47.2	6.51	40.2	55.03	30.5
July 8.8	15.13	61.2	39.10	53.7	15.67	48.7	7.31	40.3	55.41	31.5
18.8	15.44	63.0	39.41	51.8	15.99	50.4	8.13	41.0	55.80	32.7
28.7	15.74	64.7	39.71	50.2	16.31	52.1	8.93	42.1	56.18	34.2
Aug. 7.7	16.03	66.4	40.00	48.8	16.61	53.9	9.71	43.7	56.55	36.0
17.7	16.30	68.0	40.27	47.8	16.89	55.7	10.46	45.7	56.90	38.0
27.7	16.54	69.4	40.52	47.0	17.16	57.4	11.14	48.0	57.22	40.1
Sept. 6.6	16.76	70.6	40.74	46.6	17.39	59.0	11.76	50.7	57.51	42.3
16.6	16.94	71.6	40.93	46.5	17.59	60.5	12.31	53.6	57.77	44.6
26.6	17.10	72.4	41.08	46.8	17.76	61.9	12.77	56.7	57.99	46.9
Oct. 6.5	17.22	73.0	41.21	47.4	17.90	63.1	13.14	60.0	58.17	49.1
16.5	17.31	73.3	41.30	48.2	18.01	64.1	13.42	63.4	58.31	51.3
26.5	17.37	73.5	41.36	49.2	18.09	65.0	13.59	66.7	58.41	53.4
Nov. 5.5	17.40	73.4	41.39	50.4	18.13	65.6	13.66	70.0	58.47	55.3
15.4	17.41	73.2	41.39	51.7	18.14	66.1	13.62	73.1	58.49	57.1
25.4	17.38	72.9	41.36	53.1	18.13	66.4	13.47	76.0	58.48	58.6
Dec. 5.4	17.33	72.5	41.30	54.4	18.09	66.6	13.22	78.6	58.42	59.8
15.3	17.26	71.9	41.23	55.6	18.02	66.5	12.87	80.8	58.33	60.8
25.3	17.17	71.3	41.13	56.7	17.93	66.3	12.43	82.6	58.20	61.4
35.3	17.06	70.7	41.01	57.7	17.81	65.9	11.92	83.8	58.04	61.7

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Arietis.		β Trianguli.		ξ¹ Ceti.		γ Trianguli.		67 Ceti.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	h m 2 01	° ′ +22 59	h m 2 03	° ′ +34 31	h m 2 07	° ′ +8 23	h m 2 11	° ′ +33 23	h m 2 12	° ′ −6 52
	s	″	s	″	s	″	s	″	s	″
Jan. 0.3	40.32 .13	63.5 0.4	44.32 .15	35.8 0.1	49.61 .11	14.9 0.7	30.91 .14	47.8 0.1	6.89 .12	29.0 0.9
10.3	40.19 .14	63.1 0.5	44.17 .16	35.7 0.4	49.50 .13	14.2 0.7	30.77 .16	47.7 0.3	6.77 .13	29.9 0.8
20.3	40.05 .15	62.6 0.7	44.01 .18	35.3 0.6	49.37 .14	13.5 0.7	30.61 .17	47.4 0.6	6.64 .14	30.7 0.6
30.2	39.90 .16	61.9 0.9	43.83 .19	34.7 0.9	49.23 .14	12.8 0.6	30.44 .19	46.8 0.8	6.50 .15	31.3 0.4
Feb. 9.2	39.74 .15	61.0 0.9	43.64 .18	33.8 1.1	49.09 .15	12.2 0.6	30.25 .18	46.0 1.1	6.35 .15	31.7 0.2
19.2	39.59 .14	60.1 1.0	43.46 .16	32.7 1.3	48.94 .13	11.6 0.5	30.07 .16	44.9 1.2	6.20 .14	31.9 0.0
Mar. 1.2	39.45 .12	59.1 1.0	43.30 .14	31.4 1.4	48.81 .12	11.1 0.4	29.91 .15	43.7 1.3	6.06 .12	31.9 0.3
11.1	39.33 .09	58.1 1.0	43.16 .11	30.0 1.5	48.69 .09	10.7 0.3	29.76 .11	42.4 1.4	5.94 .09	31.6 0.5
21.1	39.24 .06	57.1 0.9	43.05 .06	28.5 1.5	48.60 .05	10.4 0.1	29.65 .07	41.0 1.4	5.85 .07	31.1 0.7
31.1	39.18 .01	56.2 0.7	42.99 .02	27.0 1.3	48.55 .02	10.3 0.1	29.58 .03	39.6 1.3	5.78 .02	30.4 0.9
Apr. 10.0	39.17 .04	55.5 0.6	42.97 .04	25.7 1.2	48.53 .03	10.4 0.3	29.55 .03	38.3 1.2	5.76 .01	29.5 1.2
20.0	39.21 .09	54.9 0.3	43.01 .09	24.5 1.0	48.56 .07	10.7 0.6	29.58 .08	37.1 0.9	5.77 .06	28.3 1.4
30.0	39.30 .13	54.6 0.1	43.10 .15	23.5 0.8	48.63 .12	11.3 0.7	29.66 .14	36.2 0.7	5.83 .11	26.9 1.7
May 10.0	39.43 .18	54.5 0.2	43.25 .19	22.7 0.5	48.75 .16	12.0 1.0	29.80 .18	35.5 0.5	5.94 .14	25.2 1.8
19.9	39.61 .22	54.7 0.4	43.44 .24	22.2 0.1	48.91 .20	13.0 1.2	29.98 .24	35.0 0.1	6.08 .19	23.4 1.9
29.9	39.83 .26	55.1 0.8	43.68 .29	22.1 0.1	49.11 .23	14.2 1.4	30.22 .27	34.9 0.1	6.27 .23	21.5 2.0
June 8.9	40.09 .29	55.9 0.9	43.97 .31	22.2 0.5	49.34 .27	15.6 1.5	30.49 .31	35.0 0.5	6.50 .25	19.5 2.1
18.9	40.38 .31	56.8 0.9	44.28 .34	22.7 0.8	49.61 .28	17.1 1.7	30.80 .33	35.5 0.8	6.75 .27	17.4 2.0
28.8	40.69 .32	58.0 1.2	44.62 .35	23.5 1.1	49.89 .30	18.8 1.7	31.13 .34	36.3 1.1	7.02 .30	15.4 2.0
July 8.8	41.01 .32	59.4 1.4	44.97 .36	24.6 1.4	50.19 .30	20.5 1.7	31.47 .35	37.4 1.3	7.32 .30	13.4 1.9
18.8	41.33 .33	61.0 1.6	45.33 .35	26.0 1.5	50.49 .31	22.2 1.7	31.82 .35	38.7 1.5	7.62 .30	11.5 1.7
28.7	41.66 .31	62.7 1.7	45.68 .34	27.5 1.8	50.80 .29	23.9 1.6	32.17 .34	40.2 1.6	7.92 .29	9.8 1.4
Aug. 7.7	41.97 .29	64.4 1.7	46.02 .33	29.3 1.8	51.09 .28	25.5 1.5	32.51 .33	41.8 1.8	8.21 .27	8.4 1.2
17.7	42.26 .28	66.1 1.7	46.35 .30	31.1 2.0	51.37 .26	27.0 1.3	32.84 .30	43.6 1.9	8.48 .26	7.2 0.9
27.7	42.54 .25	67.8 1.7	46.65 .27	33.1 2.0	51.63 .24	28.3 1.2	33.14 .28	45.5 1.9	8.74 .24	6.3 0.6
Sept. 6.6	42.79 .21	69.5 1.6	46.92 .24	35.1 2.0	51.87 .20	29.5 0.9	33.42 .24	47.4 1.9	8.98 .21	5.7 0.3
16.6	43.00 .19	71.1 1.4	47.16 .21	37.1 1.9	52.07 .18	30.4 0.7	33.66 .22	49.3 1.9	9.19 .18	5.4 0.1
26.6	43.19 .16	72.5 1.3	47.37 .17	39.0 1.9	52.25 .15	31.1 0.5	33.88 .18	51.2 1.8	9.37 .15	5.5 0.3
Oct. 6.6	43.35 .12	73.8 1.2	47.54 .14	40.9 1.8	52.40 .12	31.6 0.3	34.06 .14	53.0 1.7	9.52 .11	5.8 0.6
16.5	43.47 .09	75.0 1.0	47.68 .10	42.7 1.7	52.52 .09	31.9 0.1	34.20 .11	54.7 1.5	9.63 .09	6.4 0.9
26.5	43.56 .06	76.0 0.8	47.78 .07	44.4 1.5	52.61 .06	32.0 0.1	34.31 .08	56.2 1.5	9.72 .06	7.3 1.0
Nov. 5.5	43.62 .03	76.8 0.6	47.85 .03	45.9 1.3	52.67 .03	31.9 0.2	34.39 .04	57.7 1.2	9.78 .02	8.3 1.0
15.4	43.65 .01	77.4 0.5	47.88 .00	47.2 1.1	52.70 .00	31.7 0.4	34.43 .00	58.9 1.1	9.80 .00	9.5 1.2
25.4	43.64 .03	77.9 0.3	47.88 .04	48.3 0.9	52.70 .03	31.3 0.5	34.43 .03	60.0 0.9	9.80 .03	10.7 1.2
Dec. 5.4	43.61 .06	78.2 0.1	47.84 .07	49.2 0.7	52.67 .05	30.8 0.5	34.40 .06	60.9 0.6	9.77 .06	11.9 1.2
15.4	43.55 .09	78.3 0.1	47.77 .11	49.9 0.4	52.62 .08	30.3 0.6	34.34 .10	61.5 0.4	9.71 .08	13.1 1.1
25.3	43.46 .11	78.2 0.1	47.66 .13	50.3 0.1	52.54 .10	29.7 0.6	34.24 .12	61.9 0.1	9.63 .11	14.2 1.0
35.3	43.35	77.9 0.3	47.53	50.4 0.1	52.44	29.0 0.7	34.12	62.0 0.1	9.52	15.2 1.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	δ Hydri. Right Ascension	δ Hydri. Declination South.	ι Cassiopeiæ. Right Ascension	ι Cassiopeiæ. Declination North.	ξ² Ceti. Right Ascension	ξ² Ceti. Declination North.	μ Hydri. Right Ascension	μ Hydri. Declination South.	δ Ceti. Right Ascension	δ Ceti. Declination South.
	h m 2 19	° ′ −69 05	h m 2 20	° ′ +66 57	h m 2 22	° ′ + 8 01	h m 2 33	° ′ −79 31	h m 2 34	° ′ − 0 05
Jan. 0.3	61.01 (.55)	97.1 (0.9)	62.73 (.38)	59.0 (1.1)	58.26 (.11)	16.1 (0.7)	45.41 (1.17)	91.9 (1.0)	28.91 (.10)	40.9 (0.8)
10.3	60.46 (.58)	98.0 (0.4)	62.35 (.43)	60.1 (0.5)	58.15 (.13)	15.4 (0.6)	44.24 (1.23)	92.9 (0.4)	28.81 (.13)	41.7 (0.8)
20.3	59.88 (.58)	98.4 (0.3)	61.92 (.46)	60.6 (0.1)	58.02 (.14)	14.8 (0.7)	43.01 (1.26)	93.3 (0.3)	28.68 (.14)	42.5 (0.7)
30.2	59.30 (.59)	98.1 (0.8)	61.46 (.47)	60.5 (0.6)	57.88 (.15)	14.1 (0.6)	41.75 (1.25)	93.0 (0.8)	28.54 (.15)	43.2 (0.5)
Feb. 9.2	58.71 (.56)	97.3 (1.4)	60.99 (.46)	59.9 (1.1)	57.73 (.15)	13.5 (0.5)	40.50 (1.20)	92.2 (1.4)	28.39 (.15)	43.7 (0.4)
19.2	58.15 (.52)	95.9 (1.9)	60.53 (.43)	58.8 (1.6)	57.58 (.14)	13.0 (0.5)	39.30 (1.14)	90.8 (1.9)	28.24 (.15)	44.1 (0.2)
Mar. 1.2	57.63 (.48)	94.0 (2.4)	60.10 (.37)	57.2 (2.0)	57.44 (.12)	12.5 (0.4)	38.16 (1.03)	88.9 (2.4)	28.09 (.13)	44.3 (0.1)
11.1	57.15 (.40)	91.6 (2.8)	59.73 (.30)	55.2 (2.3)	57.32 (.10)	12.1 (0.2)	37.13 (0.91)	86.5 (2.8)	27.96 (.11)	44.4 (0.1)
21.1	56.75 (.33)	88.8 (3.1)	59.43 (.22)	52.9 (2.5)	57.22 (.07)	11.9 (0.1)	36.22 (0.76)	83.7 (3.1)	27.85 (.08)	44.3 (0.4)
31.1	56.42 (.24)	85.7 (3.3)	59.21 (.11)	50.4 (2.6)	57.15 (.04)	11.8 (0.1)	35.46 (0.59)	80.6 (3.4)	27.77 (.05)	43.9 (0.5)
Apr. 10.1	56.18 (.14)	82.4 (3.6)	59.10 (.01)	47.8 (2.7)	57.11 (.01)	11.9 (0.3)	34.87 (0.42)	77.2 (3.5)	27.72 (.00)	43.4 (0.8)
20.0	56.04 (.04)	78.8 (3.6)	59.09 (.11)	45.1 (2.5)	57.12 (.06)	12.2 (0.5)	34.45 (0.22)	73.7 (3.6)	27.72 (.04)	42.6 (1.0)
30.0	56.00 (.07)	75.2 (3.7)	59.20 (.21)	42.6 (2.4)	57.18 (.10)	12.7 (0.8)	34.23 (0.03)	70.1 (3.7)	27.76 (.09)	41.6 (1.2)
May 10.0	56.07 (.17)	71.5 (3.6)	59.41 (.31)	40.2 (2.1)	57.28 (.15)	13.5 (1.0)	34.20 (0.17)	66.4 (3.7)	27.85 (.13)	40.4 (1.4)
19.9	56.24 (.27)	67.9 (3.5)	59.72 (.41)	38.1 (1.8)	57.43 (.19)	14.5 (1.1)	34.37 (0.36)	62.8 (3.6)	27.98 (.17)	39.0 (1.5)
29.9	56.51 (.36)	64.4 (3.3)	60.13 (.49)	36.3 (1.4)	57.62 (.22)	15.6 (1.4)	34.73 (0.55)	59.4 (3.2)	28.15 (.21)	37.5 (1.7)
June 8.9	56.87 (.45)	61.1 (3.3)	60.62 (.55)	34.9 (1.0)	57.84 (.26)	17.0 (1.5)	35.28 (0.72)	56.2 (3.0)	28.36 (.24)	35.8 (1.8)
18.9	57.32 (.52)	58.2 (2.9)	61.17 (.61)	33.9 (0.5)	58.10 (.27)	18.5 (1.6)	36.00 (0.87)	53.2 (2.5)	28.60 (.27)	34.0 (1.8)
28.8	57.84 (.57)	55.6 (2.6)	61.78 (.64)	33.4 (0.1)	58.37 (.30)	20.1 (1.6)	36.87 (0.99)	50.7 (2.1)	28.87 (.28)	32.2 (1.9)
July 8.8	58.41 (.62)	53.5 (2.1)	62.42 (.66)	33.3 (0.4)	58.67 (.30)	21.7 (1.7)	37.86 (1.09)	48.6 (1.6)	29.15 (.30)	30.3 (1.8)
18.8	59.03 (.64)	51.9 (1.6)	63.08 (.67)	33.7 (0.9)	58.97 (.30)	23.4 (1.7)	38.95 (1.16)	47.0 (1.0)	29.45 (.30)	28.5 (1.7)
28.8	59.67 (.65)	50.9 (1.0)	63.75 (.65)	34.6 (1.2)	59.27 (.30)	25.1 (1.7)	40.11 (1.19)	46.0 (0.4)	29.75 (.29)	26.8 (1.5)
Aug. 7.7	60.32 (.63)	50.4 (0.5)	64.40 (.64)	35.8 (1.7)	59.57 (.30)	26.6 (1.5)	41.30 (1.19)	45.6 (0.4)	30.04 (.29)	25.3 (1.5)
17.7	60.95 (.60)	50.5 (0.1)	65.04 (.59)	37.5 (2.0)	59.86 (.29)	28.1 (1.5)	42.48 (1.18)	45.7 (0.1)	30.32 (.28)	24.0 (1.3)
27.7	61.55 (.55)	51.3 (0.8)	65.63 (.55)	39.5 (2.4)	60.12 (.26)	29.4 (1.3)	43.62 (1.14)	46.5 (0.8)	30.59 (.27)	22.9 (1.1)
Sept. 6.6	62.10 (.48)	52.6 (1.3)	66.18 (.50)	41.9 (2.6)	60.37 (.25)	30.5 (1.1)	44.68 (1.06)	47.9 (1.4)	30.84 (.25)	22.1 (0.8)
16.6	62.58 (.40)	54.5 (1.9)	66.68 (.44)	44.5 (2.8)	60.59 (.22)	31.4 (0.9)	45.62 (0.94)	49.8 (1.9)	31.06 (.22)	21.6 (0.5)
26.6	62.98 (.31)	56.8 (2.3)	67.12 (.36)	47.3 (3.0)	60.78 (.19)	32.0 (0.6)	46.41 (0.79)	52.2 (2.4)	31.26 (.20)	21.3 (0.3)
Oct. 6.6	63.29 (.20)	59.6 (2.8)	67.48 (.30)	50.3 (3.1)	60.94 (.16)	32.5 (0.5)	47.02 (0.61)	54.9 (2.7)	31.43 (.17)	21.3 (0.0)
16.5	63.49 (.09)	62.7 (3.1)	67.78 (.22)	53.4 (3.1)	61.08 (.14)	32.7 (0.2)	47.43 (0.41)	58.0 (3.1)	31.57 (.14)	21.6 (0.3)
26.5	63.58 (.01)	65.9 (3.2)	68.00 (.13)	56.5 (3.1)	61.18 (.10)	32.7 (0.0)	47.62 (0.19)	61.3 (3.1)	31.68 (.11)	22.0 (0.3)
Nov. 5.5	63.57 (12)	69.2 (3.3)	68.13 (.05)	59.6 (3.0)	61.25 (.07)	32.6 (0.1)	47.60 (0.02)	64.6 (3.3)	31.76 (.08)	22.7 (0.7)
15.5	63.45 (.22)	72.4 (3.3)	68.18 (.03)	62.6 (3.0)	61.30 (.05)	32.3 (0.3)	47.34 (0.26)	67.9 (3.3)	31.81 (.05)	23.5 (0.8)
25.4	63.23 (.32)	75.4 (3.2)	68.15 (.12)	65.4 (2.8)	61.31 (.01)	31.9 (0.4)	46.88 (0.46)	71.0 (3.1)	31.84 (.03)	24.4 (0.9)
Dec. 5.4	62.91 (.40)	78.2 (2.8)	68.03 (.20)	67.9 (2.5)	61.30 (.01)	31.4 (0.5)	46.22 (0.66)	73.8 (2.8)	31.83 (.01)	25.3 (0.9)
15.4	62.51 (.46)	80.5 (2.3)	67.83 (.28)	70.1 (2.2)	61.26 (.04)	30.8 (0.6)	45.38 (0.84)	76.1 (2.3)	31.79 (.04)	26.3 (1.0)
25.3	62.05 (.52)	82.4 (1.9)	67.55 (.36)	71.9 (1.8)	61.19 (.07)	30.2 (0.6)	44.39 (0.99)	78.0 (1.9)	31.73 (.06)	27.3 (1.0)
35.3	61.53 (.52)	83.7 (1.3)	67.19 (.36)	73.3 (1.4)	61.09 (.10)	29.5 (0.7)	43.28 (1.11)	79.3 (1.3)	31.64 (.09)	28.2 (0.9)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	θ Persei. Right Ascension.	θ Persei. Declination North.	γ Ceti. Right Ascension.	γ Ceti. Declination North.	σ Arietis. Right Ascension.	σ Arietis. Declination North.	47 Cephei. Right Ascension.	47 Cephei. Declination North.	ε Arietis. Right Ascension.	ε Arietis. Declination North.
	h m 2 37	° ′ +48 48	h m 2 38	° ′ + 2 49	h m 2 46	° ′ +14 40	h m 2 53	° ′ +79 01	h m 2 53	° ′ +20 56
	s	″	s	″	s	″	s	″	s	″
Jan. 0.3	32.59 (.17)	62.3 (0.6)	14.74 (.10)	21.0 (0.8)	6.45 (.10)	43.6 (0.5)	10.02 (0.79)	68.8 (1.7)	38.14 (.10)	57.7 (0.3)
10.3	32.42 (.22)	62.9 (0.2)	14.64 (.13)	20.2 (0.7)	6.35 (.12)	43.1 (0.5)	9.23 (0.92)	70.5 (1.2)	38.04 (.13)	57.4 (0.3)
20.3	32.20 (.24)	63.1 (0.2)	14.51 (.14)	19.5 (0.7)	6.23 (.14)	42.6 (0.6)	8.31 (1.00)	71.7 (0.7)	37.91 (.15)	57.1 (0.5)
30.3	31.96 (.25)	62.9 (0.6)	14.37 (.15)	18.8 (0.5)	6.09 (.16)	42.0 (0.6)	7.31 (1.05)	72.4 (0.0)	37.76 (.16)	56.6 (0.6)
Feb. 9.2	31.71 (.25)	62.3 (0.9)	14.22 (.15)	18.3 (0.5)	5.93 (.16)	41.4 (0.6)	6.26 (1.05)	72.4 (0.6)	37.60 (.17)	56.0 (0.6)
19.2	31.46 (.24)	61.4 (1.3)	14.07 (.15)	17.8 (0.3)	5.77 (.16)	40.8 (0.6)	5.21 (1.00)	71.8 (1.2)	37.43 (.16)	55.4 (0.7)
Mar. 1.2	31.22 (.22)	60.1 (1.5)	13.92 (.14)	17.5 (0.2)	5.61 (.14)	40.2 (0.6)	4.21 (0.91)	70.6 (1.7)	37.27 (.16)	54.7 (0.8)
11.2	31.00 (.18)	58.6 (1.8)	13.78 (.11)	17.3 (0.0)	5.47 (.12)	39.6 (0.5)	3.30 (0.78)	68.9 (2.1)	37.11 (.13)	53.9 (0.7)
21.1	30.82 (.13)	56.8 (1.9)	13.67 (.08)	17.3 (0.2)	5.35 (.09)	39.1 (0.4)	2.52 (0.62)	66.8 (2.5)	36.98 (.10)	53.2 (0.7)
31.1	30.69 (.07)	54.9 (1.9)	13.59 (.05)	17.5 (0.4)	5.26 (.05)	38.7 (0.3)	1.90 (0.43)	64.3 (2.8)	36.88 (.06)	52.5 (0.6)
Apr. 10.1	30.62 (.01)	53.0 (2.0)	13.54 (.00)	17.9 (0.6)	5.21 (.01)	38.4 (0.1)	1.47 (0.22)	61.5 (2.9)	36.82 (.02)	51.9 (0.4)
20.0	30.61 (.06)	51.0 (1.8)	13.54 (.04)	18.5 (0.8)	5.20 (.04)	38.3 (0.1)	1.25 (0.00)	58.6 (2.9)	36.80 (.04)	51.5 (0.3)
30.0	30.67 (.12)	49.2 (1.6)	13.58 (.08)	19.3 (1.0)	5.24 (.08)	38.4 (0.3)	1.25 (0.22)	55.7 (2.9)	36.84 (.08)	51.2 (0.1)
May 10.0	30.79 (.19)	47.6 (1.4)	13.66 (.13)	20.3 (1.2)	5.32 (.13)	38.7 (0.6)	1.47 (0.43)	52.8 (2.7)	36.92 (.13)	51.1 (0.1)
20.0	30.98 (.26)	46.2 (1.1)	13.79 (.17)	21.5 (1.4)	5.45 (.17)	39.3 (0.7)	1.90 (0.62)	50.1 (2.4)	37.05 (.17)	51.2 (0.3)
29.9	31.24 (.30)	45.1 (0.8)	13.96 (.21)	22.9 (1.5)	5.62 (.22)	40.0 (0.9)	2.52 (0.80)	47.7 (2.2)	37.22 (.21)	51.5 (0.6)
June 8.9	31.54 (.35)	44.3 (0.4)	14.17 (.24)	24.4 (1.7)	5.84 (.24)	40.9 (1.1)	3.32 (0.96)	45.5 (1.7)	37.43 (.25)	52.1 (0.8)
18.9	31.89 (.39)	43.9 (0.0)	14.41 (.26)	26.1 (1.7)	6.08 (.28)	42.0 (1.3)	4.28 (1.08)	43.8 (1.3)	37.68 (.28)	52.9 (1.0)
28.9	32.28 (.41)	43.9 (0.3)	14.67 (.29)	27.8 (1.8)	6.36 (.29)	43.3 (1.4)	5.36 (1.18)	42.5 (0.8)	37.96 (.30)	53.9 (1.1)
July 8.8	32.69 (.42)	44.2 (0.7)	14.96 (.29)	29.6 (1.7)	6.65 (.30)	44.7 (1.4)	6.54 (1.25)	41.7 (0.3)	38.26 (.32)	55.0 (1.3)
18.8	33.11 (.43)	44.9 (1.0)	15.25 (.30)	31.3 (1.7)	6.95 (.31)	46.1 (1.5)	7.79 (1.29)	41.4 (0.1)	38.58 (.32)	56.3 (1.3)
28.8	33.54 (.42)	45.9 (1.3)	15.55 (.29)	33.0 (1.5)	7.26 (.31)	47.6 (1.5)	9.08 (1.30)	41.5 (0.6)	38.90 (.31)	57.6 (1.3)
Aug. 7.7	33.96 (.41)	47.2 (1.5)	15.84 (.29)	34.5 (1.3)	7.57 (.30)	49.1 (1.5)	10.38 (1.30)	42.1 (1.1)	39.21 (.31)	59.0 (1.4)
17.7	34.37 (.39)	48.7 (1.8)	16.13 (.27)	35.8 (1.2)	7.87 (.28)	50.6 (1.3)	11.67 (1.29)	43.2 (1.5)	39.52 (.29)	60.5 (1.5)
27.7	34.76 (.36)	50.5 (2.0)	16.40 (.25)	37.0 (0.9)	8.15 (.26)	51.9 (1.2)	12.91 (1.18)	44.7 (2.0)	39.81 (.28)	61.9 (1.3)
Sept. 6.7	35.12 (.34)	52.5 (2.1)	16.65 (.23)	37.9 (0.6)	8.41 (.24)	53.1 (1.1)	14.09 (1.10)	46.7 (2.3)	40.09 (.25)	63.2 (1.3)
16.6	35.46 (.30)	54.6 (2.1)	16.88 (.20)	38.5 (0.4)	8.65 (.22)	54.2 (0.9)	15.19 (0.98)	49.0 (2.6)	40.34 (.23)	64.5 (1.1)
26.6	35.76 (.25)	56.9 (2.3)	17.08 (.17)	38.9 (0.1)	8.87 (.19)	55.1 (0.7)	16.17 (0.87)	51.6 (2.9)	40.57 (.21)	65.6 (1.0)
Oct. 6.6	36.01 (.22)	59.2 (2.3)	17.25 (.15)	39.0 (0.1)	9.06 (.16)	55.8 (0.6)	17.04 (0.72)	54.5 (3.2)	40.78 (.17)	66.6 (0.9)
16.6	36.23 (.17)	61.5 (2.3)	17.40 (.11)	38.9 (0.3)	9.22 (.13)	56.4 (0.3)	17.76 (0.57)	57.7 (3.3)	40.95 (.15)	67.5 (0.7)
26.5	36.40 (.13)	63.8 (2.2)	17.51 (.09)	38.6 (0.5)	9.35 (.10)	56.7 (0.3)	18.33 (0.40)	61.0 (3.3)	41.10 (.11)	68.2 (0.6)
Nov. 5.5	36.53 (.08)	66.0 (2.1)	17.60 (.06)	38.1 (0.6)	9.45 (.07)	57.0 (0.1)	18.73 (0.21)	64.3 (3.4)	41.21 (.09)	68.8 (0.4)
15.5	36.61 (.04)	68.1 (1.9)	17.66 (.02)	37.5 (0.8)	9.52 (.04)	57.1 (0.1)	18.94 (0.02)	67.7 (3.3)	41.30 (.05)	69.2 (0.3)
25.4	36.65 (.02)	70.0 (1.8)	17.68 (.00)	36.7 (0.8)	9.56 (.01)	57.0 (0.1)	18.96 (0.17)	71.0 (3.1)	41.35 (.01)	69.5 (0.2)
Dec. 5.4	36.63 (.07)	71.8 (1.5)	17.68 (.03)	35.9 (0.8)	9.57 (.02)	56.8 (0.2)	18.79 (0.37)	74.1 (2.8)	41.36 (.01)	69.7 (0.1)
15.4	36.56 (.11)	73.3 (1.2)	17.65 (.06)	35.1 (0.9)	9.55 (.05)	56.6 (0.4)	18.42 (0.54)	76.9 (2.5)	41.35 (.05)	69.8 (0.0)
25.4	36.45 (.16)	74.5 (0.8)	17.59 (.09)	34.2 (0.8)	9.50 (.09)	56.2 (0.4)	17.88 (0.72)	79.4 (2.1)	41.30 (.09)	69.8 (0.2)
35.3	36.29	75.3	17.50	33.4	9.41	55.8 (0.4)	17.16 (0.72)	81.5	41.21	69.6 (0.2)

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ceti. Right Ascension.	α Ceti. Declination North.	β Persei. Right Ascension.	β Persei. Declination North.	48 Cephei (H.). Right Ascension.	48 Cephei (H.). Declination North.	ζ Arietis. Right Ascension.	ζ Arietis. Declination North.	α Persei. Right Ascension.	α Persei. Declination North.
	h m 2 57	° ' +3 42	h m 3 01	° ' +40 34	h m 3 07	° ' +77 22	h m 3 09	° ' +20 40	h m 3 17	° ' +49 30
	s	"	s	"	s	"	s	"	s	"
Jan. 0.4	10.88 .09	17.4 0.8	49.63 .13	49.5 0.5	59.26 0.64	43.0 1.9	17.83 .09	55.0 0.2	22.08 .15	53.7 1.0
10.3	10.79 .12	16.6 0.7	49.50 .16	50.0 0.2	58.62 0.75	44.9 1.3	17.74 .12	54.8 0.3	21.93 .19	54.7 0.6
20.3	10.67 .14	15.9 0.7	49.34 .19	50.2 0.1	57.87 0.84	46.2 0.8	17.62 .14	54.5 0.4	21.74 .23	55.3 0.2
30.3	10.53 .15	15.2 0.7	49.15 .21	50.1 0.4	57.03 0.90	47.0 0.2	17.48 .17	54.1 0.5	21.51 .25	55.5 0.1
Feb. 9.2	10.38 .16	14.7 0.5	48.94 .22	49.7 0.7	56.13 0.91	47.2 0.4	17.31 .17	53.6 0.6	21.26 .27	55.4 0.6
19.2	10.22 .16	14.2 0.4	48.72 .22	49.0 0.9	55.22 0.88	46.8 1.0	17.14 .17	53.0 0.6	20.99 .27	54.8 0.9
Mar. 1.2	10.06 .14	13.8 0.2	48.50 .20	48.1 1.2	54.34 0.82	45.8 1.5	16.97 .16	52.4 0.7	20.72 .25	53.9 1.2
11.2	9.92 .13	13.6 0.0	48.30 .17	46.9 1.4	53.52 0.72	44.3 2.0	16.81 .14	51.7 0.7	20.47 .22	52.7 1.4
21.1	9.79 .10	13.6 0.1	48.13 .14	45.5 1.5	52.80 0.58	42.3 2.4	16.67 .11	51.0 0.7	20.25 .18	51.3 1.7
31.1	9.69 .06	13.7 0.3	47.99 .08	44.0 1.5	52.22 0.42	39.9 2.6	16.56 .08	50.3 0.5	20.07 .12	49.6 1.8
Apr. 10.1	9.63 .02	14.0 0.5	47.91 .04	42.5 1.5	51.80 0.24	37.3 2.8	16.48 .03	49.8 0.4	19.95 .07	47.8 1.9
20.1	9.61 .02	14.5 0.8	47.87 .03	41.0 1.4	51.56 0.06	34.5 2.9	16.45 .01	49.4 0.3	19.88 .00	45.9 1.8
30.0	9.63 .06	15.3 0.9	47.90 .08	39.6 1.2	51.50 0.14	31.6 2.9	16.46 .07	49.1 0.1	19.88 .07	44.1 1.7
May 10.0	9.69 .11	16.2 1.1	47.98 .15	38.4 1.0	51.64 0.32	28.7 2.7	16.53 .11	49.0 0.0	19.95 .14	42.4 1.6
20.0	9.80 .16	17.3 1.3	48.13 .19	37.4 0.8	51.96 0.50	26.0 2.5	16.64 .16	49.0 0.3	20.09 .20	40.8 1.4
29.9	9.96 .20	18.6 1.5	48.32 .25	36.6 0.6	52.46 0.66	23.5 2.2	16.80 .20	49.3 0.5	20.29 .27	39.4 1.0
June 8.9	10.16 .22	20.1 1.5	48.57 .30	36.0 0.2	53.12 0.81	21.3 1.8	17.00 .24	49.8 0.8	20.56 .31	38.4 0.8
18.9	10.38 .26	21.6 1.5	48.87 .32	35.8 0.1	53.93 0.92	19.5 1.4	17.24 .27	50.6 0.9	20.87 .36	37.6 0.5
28.9	10.64 .28	23.3 1.7	49.19 .35	35.9 0.3	54.85 1.02	18.1 1.0	17.51 .29	51.5 1.0	21.23 .39	37.1 0.1
July 8.8	10.92 .29	25.0 1.7	49.54 .37	36.2 0.7	55.87 1.08	17.1 0.5	17.80 .31	52.5 1.2	21.62 .41	37.0 0.2
18.8	11.21 .29	26.6 1.6	49.91 .38	36.9 0.9	56.95 1.13	16.6 0.0	18.11 .31	53.7 1.3	22.03 .43	37.2 0.5
28.8	11.50 .30	28.2 1.6	50.29 .38	37.8 1.1	58.08 1.15	16.6 0.4	18.42 .32	55.0 1.3	22.46 .43	37.7 0.8
Aug. 7.8	11.80 .29	29.7 1.5	50.67 .37	38.9 1.4	59.23 1.15	17.0 0.9	18.74 .31	56.3 1.3	22.89 .43	38.5 1.1
17.7	12.09 .27	31.0 1.3	51.04 .36	40.3 1.5	60.38 1.11	17.9 1.3	19.05 .30	57.6 1.3	23.32 .42	39.6 1.4
27.7	12.36 .26	32.2 1.2	51.40 .33	41.8 1.6	61.49 1.07	19.2 1.8	19.35 .28	58.9 1.2	23.74 .40	41.0 1.5
Sept. 6.7	12.62 .24	33.1 0.9	51.73 .32	43.4 1.7	62.56 1.01	21.0 2.1	19.63 .27	60.1 1.2	24.14 .37	42.5 1.7
16.6	12.86 .22	33.7 0.6	52.05 .28	45.1 1.8	63.57 0.91	23.1 2.4	19.90 .24	61.3 1.0	24.51 .35	44.2 1.9
26.6	13.08 .19	34.1 0.4	52.33 .26	46.9 1.8	64.48 0.82	25.5 2.8	20.14 .21	62.3 1.0	24.86 .31	46.1 2.0
Oct. 6.6	13.27 .16	34.3 0.2	52.59 .22	48.7 1.8	65.30 0.70	28.3 3.0	20.35 .19	63.2 0.8	25.17 .27	48.1 2.1
16.6	13.43 .14	34.2 0.1	52.81 .18	50.5 1.8	66.00 0.57	31.3 3.1	20.54 .16	64.0 0.7	25.44 .24	50.2 2.1
26.5	13.57 .10	33.9 0.3	52.99 .15	52.3 1.7	66.57 0.42	34.4 3.3	20.70 .13	64.7 0.5	25.68 .19	52.3 2.1
Nov. 5.5	13.67 .08	33.4 0.5	53.14 .11	54.0 1.6	66.99 0.27	37.7 3.3	20.83 .10	65.2 0.4	25.87 .15	54.4 2.1
15.5	13.75 .05	32.8 0.6	53.25 .07	55.6 1.5	67.26 0.10	41.0 3.2	20.93 .07	65.6 0.3	26.02 .09	56.5 2.0
25.5	13.80 .01	32.0 0.8	53.32 .02	57.1 1.3	67.36 0.08	44.2 3.1	21.00 .03	65.9 0.1	26.11 .04	58.5 1.8
Dec. 5.4	13.81 .01	31.2 0.8	53.34 .02	58.4 1.2	67.28 0.24	47.3 2.9	21.03 .00	66.0 0.1	26.15 .01	60.3 1.7
15.4	13.80 .05	30.4 0.8	53.32 .06	59.6 1.0	67.04 0.40	50.2 2.5	21.03 .03	66.1 0.0	26.14 .07	62.0 1.4
25.4	13.75 .08	29.6 0.8	53.26 .11	60.5 0.9	66.64 0.56	52.7 2.2	21.00 .08	66.1 0.2	26.07 .12	63.4 1.2
35.3	13.67	28.8	53.15	61.2	66.08	54.9	20.92	65.9	25.95	64.6

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Hydri. Right Ascension.	ι Hydri. Declination. South.	f Tauri. Right Ascension.	f Tauri. Declination. North.	ε Eridani. Right Ascension.	ε Eridani. Declination. South.	δ Persei. Right Ascension.	δ Persei. Declination. North.	γ Camelopardalis. Right Ascension.	γ Camelopardalis. Declination. North.
	h m 3 18	° ' −77 44	h m 3 25	° ' +12 35	h m 3 28	° ' − 9 47	h m 3 35	° ' +47 28	h m 3 40	° ' +71 01
	s	"	s	"	s	"	s	"	s	"
Jan. 0.4	25.79 (0.92)	65.5 (1.6)	29.47 (.08)	62.7 (0.5)	20.34 (.09)	30.0 (1.3)	59.38 (.12)	34.3 (1.0)	5.65 (.33)	59.2 (2.0)
10.3	24.87 (1.01)	67.1 (1.1)	29.39 (.11)	62.2 (0.5)	20.25 (.12)	31.3 (1.0)	59.26 (.16)	35.3 (0.7)	5.32 (.43)	61.2 (1.5)
20.3	23.86 (1.07)	68.2 (0.5)	29.28 (.13)	61.7 (0.5)	20.13 (.14)	32.3 (0.9)	59.10 (.21)	36.0 (0.4)	4.89 (.50)	62.7 (1.0)
30.3	22.79 (1.09)	68.7 (0.1)	29.15 (.16)	61.2 (0.5)	19.99 (.16)	33.2 (0.6)	58.89 (.24)	36.4 (0.0)	4.39 (.56)	63.7 (0.5)
Feb. 9.3	21.70 (1.10)	68.6 (0.7)	28.99 (.16)	60.7 (0.5)	19.83 (.18)	33.8 (0.4)	58.65 (.26)	36.4 (0.4)	3.83 (.59)	64.2 (0.0)
19.2	20.60 (1.07)	67.9 (1.3)	28.83 (.17)	60.2 (0.5)	19.65 (.17)	34.2 (0.1)	58.39 (.26)	36.0 (0.7)	3.24 (.60)	64.2 (0.6)
Mar. 1.2	19.53 (1.01)	66.6 (1.7)	28.66 (.16)	59.7 (0.4)	19.48 (.17)	34.3 (0.1)	58.13 (.25)	35.3 (1.0)	2.64 (.57)	63.6 (1.2)
11.2	18.52 (0.92)	64.9 (2.2)	28.50 (.15)	59.3 (0.3)	19.31 (.16)	34.2 (0.4)	57.88 (.22)	34.3 (1.2)	2.07 (.52)	62.4 (1.6)
21.2	17.60 (0.82)	62.7 (2.6)	28.35 (.12)	59.0 (0.3)	19.15 (.13)	33.8 (0.7)	57.66 (.19)	33.1 (1.5)	1.55 (.44)	60.8 (1.9)
31.1	16.78 (0.70)	60.1 (3.0)	28.23 (.08)	58.7 (0.2)	19.02 (.10)	33.1 (0.9)	57.47 (.14)	31.6 (1.7)	1.11 (.35)	58.9 (2.3)
Apr. 10.1	16.08 (0.55)	57.1 (3.2)	28.15 (.05)	58.5 (0.0)	18.92 (.06)	32.2 (1.2)	57.33 (.09)	29.9 (1.7)	0.76 (.23)	56.6 (2.5)
20.1	15.53 (0.39)	53.9 (3.4)	28.10 (.00)	58.5 (0.2)	18.86 (.02)	31.0 (1.4)	57.24 (.02)	28.2 (1.7)	0.53 (.11)	54.1 (2.6)
30.0	15.14 (0.23)	50.5 (3.4)	28.10 (.04)	58.7 (0.2)	18.84 (.03)	29.6 (1.4)	57.22 (.04)	26.5 (1.7)	0.42 (.02)	51.5 (2.6)
May 10.0	14.91 (0.05)	46.9 (3.6)	28.14 (.09)	59.0 (0.3)	18.87 (.07)	28.0 (1.6)	57.26 (.11)	24.9 (1.6)	0.44 (.16)	48.8 (2.7)
20.0	14.86 (0.13)	43.3 (3.6)	28.23 (.14)	59.6 (0.6)	18.94 (.12)	26.2 (1.8)	57.37 (.17)	23.4 (1.5)	0.60 (.27)	46.2 (2.6)
30.0	14.99 (0.29)	39.8 (3.5)	28.37 (.18)	60.3 (0.7)	19.06 (.16)	24.2 (2.0)	57.54 (.24)	22.0 (1.4)	0.87 (.40)	43.8 (2.4)
June 8.9	15.28 (0.45)	36.3 (3.5)	28.55 (.21)	61.2 (0.9)	19.22 (.20)	22.2 (2.0)	57.78 (.28)	20.9 (1.1)	1.27 (.50)	41.6 (2.2)
18.9	15.73 (0.61)	33.1 (3.2)	28.76 (.25)	62.2 (1.0)	19.42 (.22)	20.1 (2.1)	58.06 (.33)	20.1 (0.8)	1.77 (.59)	39.7 (1.9)
28.9	16.34 (0.74)	30.2 (2.9)	29.01 (.27)	63.4 (1.2)	19.64 (.26)	18.0 (2.1)	58.39 (.37)	19.6 (0.5)	2.36 (.67)	38.2 (1.5)
July 8.9	17.08 (0.85)	27.7 (2.5)	29.28 (.29)	64.7 (1.3)	19.90 (.27)	15.9 (2.1)	58.76 (.39)	19.4 (0.2)	3.03 (.73)	37.0 (1.2)
18.8	17.93 (0.93)	25.6 (1.6)	29.57 (.30)	66.0 (1.3)	20.17 (.28)	14.0 (1.8)	59.15 (.41)	19.4 (0.0)	3.76 (.77)	36.2 (0.8)
28.8	18.86 (1.00)	24.0 (1.1)	29.87 (.30)	67.4 (1.4)	20.45 (.29)	12.2 (1.5)	59.56 (.41)	19.8 (0.4)	4.53 (.80)	35.8 (0.4)
Aug. 7.8	19.86 (1.03)	22.9 (1.1)	30.17 (.30)	68.7 (1.3)	20.74 (.29)	10.7 (1.3)	59.97 (.42)	20.4 (0.6)	5.33 (.80)	35.9 (0.1)
17.7	20.89 (1.02)	22.5 (0.4)	30.47 (.29)	70.0 (1.3)	21.03 (.28)	9.4 (1.3)	60.39 (.41)	21.3 (0.9)	6.13 (.80)	36.4 (0.5)
27.7	21.91 (0.99)	22.7 (0.2)	30.76 (.28)	71.1 (1.1)	21.31 (.27)	8.5 (0.9)	60.80 (.39)	22.4 (1.1)	6.93 (.77)	37.3 (0.9)
Sept. 6.7	22.90 (0.92)	23.5 (0.8)	31.04 (.26)	72.1 (1.0)	21.58 (.25)	7.9 (0.6)	61.19 (.38)	23.8 (1.4)	7.70 (.75)	38.6 (1.3)
16.7	23.82 (0.82)	24.9 (1.4)	31.30 (.24)	73.0 (0.9)	21.83 (.24)	7.7 (0.2)	61.57 (.35)	25.3 (1.5)	8.45 (.69)	40.3 (1.7)
26.6	24.64 (0.69)	26.8 (1.9)	31.54 (.22)	73.7 (0.7)	22.07 (.21)	7.8 (0.1)	61.92 (.32)	26.9 (1.6)	9.14 (.64)	42.3 (2.0)
Oct. 6.6	25.33 (0.54)	29.2 (2.4)	31.76 (.20)	74.2 (0.5)	22.28 (.18)	8.3 (0.5)	62.24 (.29)	28.7 (1.8)	9.78 (.57)	44.6 (2.3)
16.6	25.87 (0.37)	32.1 (2.9)	31.96 (.16)	74.5 (0.3)	22.46 (.16)	9.1 (0.8)	62.53 (.25)	30.5 (1.8)	10.35 (.50)	47.1 (2.5)
26.6	26.24 (0.18)	35.2 (3.1)	32.12 (.14)	74.6 (0.1)	22.62 (.13)	10.2 (1.1)	62.78 (.22)	32.4 (1.9)	10.85 (.40)	49.8 (2.7)
Nov. 5.5	26.42 (0.00)	38.6 (3.4)	32.26 (.12)	74.6 (0.0)	22.75 (.09)	11.5 (1.3)	63.00 (.17)	34.3 (1.9)	11.25 (.30)	52.7 (2.9)
15.5	26.42 (0.20)	42.0 (3.4)	32.38 (.07)	74.4 (0.2)	22.84 (.07)	13.0 (1.5)	63.17 (.12)	36.2 (1.9)	11.55 (.19)	55.7 (3.0)
25.5	26.22 (0.39)	45.3 (3.3)	32.45 (.05)	74.2 (0.2)	22.91 (.03)	14.6 (1.6)	63.29 (.07)	38.0 (1.9)	11.74 (.08)	58.6 (2.9)
Dec. 5.4	25.83 (0.56)	48.4 (3.1)	32.50 (.01)	73.9 (0.3)	22.94 (.00)	16.2 (1.6)	63.36 (.01)	39.8 (1.8)	11.82 (.04)	61.5 (2.9)
15.4	25.27 (0.71)	51.3 (2.9)	32.51 (.02)	73.5 (0.4)	22.94 (.04)	17.8 (1.6)	63.37 (.04)	41.4 (1.8)	11.78 (.15)	64.3 (2.8)
25.4	24.56 (0.84)	53.7 (2.4)	32.49 (.06)	73.0 (0.5)	22.90 (.07)	19.3 (1.5)	63.33 (.09)	42.8 (1.4)	11.63 (.28)	66.8 (2.5)
35.4	23.72	55.7 (2.0)	32.43	72.5 (0.5)	22.83	20.7 (1.4)	63.24	44.0 (1.2)	11.35	69.0 (2.2)

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Tauri. Right Ascension.	η Tauri. Declination North.	ζ Persei. Right Ascension.	ζ Persei. Declination North.	γ Hydri. Right Ascension.	γ Hydri. Declination South.	ε Persei. Right Ascension.	ε Persei. Declination North.	γ Eridani. Right Ascension.	γ Eridani. Declination South.
	h m 3 41	° ' +23 48	h m 3 47	° ' +31 35	h m 3 48	° ' −74 31	h m 3 51	° ' +39 43	h m 3 53	° ' −13 46
	s	"	s	"	s	"	s	"	s	"
Jan. 0.4	41.47	9.1	60.41	36.4	47.67	99.1	19.02	40.7	29.07	82.1
10.3	41.40	9.1	60.34	36.7	47.01	101.2	18.93	41.4	29.00	83.6
20.3	41.29	9.0	60.22	36.9	46.27	102.7	18.80	41.9	28.89	84.9
30.3	41.16	8.8	60.07	36.9	45.45	103.7	18.64	42.2	28.75	85.9
Feb. 9.3	40.99	8.5	59.90	36.8	44.59	104.2	18.44	42.2	28.59	86.6
19.2	40.81	8.0	59.70	36.4	43.71	104.0	18.22	41.9	28.41	87.1
Mar. 1.2	40.63	7.5	59.50	35.9	42.84	103.3	17.99	41.4	28.22	87.3
11.2	40.45	6.9	59.31	35.1	41.99	102.0	17.77	40.6	28.04	87.1
21.2	40.29	6.2	59.13	34.3	41.20	100.2	17.57	39.6	27.87	86.7
31.1	40.15	5.5	58.97	33.4	40.48	98.0	17.39	38.5	27.72	86.0
Apr. 10.1	40.04	4.9	58.85	32.4	39.84	95.4	17.25	37.2	27.60	85.0
20.1	39.98	4.3	58.78	31.5	39.32	92.5	17.17	35.9	27.52	83.7
30.1	39.96	3.8	58.76	30.6	38.92	89.3	17.13	34.6	27.47	82.2
May 10.0	40.00	3.5	58.78	29.8	38.64	85.9	17.16	33.3	27.47	80.5
20.0	40.08	3.3	58.87	29.2	38.51	82.4	17.24	32.2	27.52	78.5
30.0	40.21	3.3	59.00	28.7	38.51	78.8	17.38	31.3	27.61	76.5
June 8.9	40.39	3.5	59.18	28.4	38.66	75.3	17.58	30.5	27.75	74.3
18.9	40.61	3.9	59.41	28.3	38.94	71.9	17.82	30.0	27.92	72.0
28.9	40.86	4.5	59.67	28.5	39.35	68.8	18.10	29.7	28.13	69.8
July 8.9	41.14	5.2	59.97	28.8	39.88	66.0	18.42	29.7	28.37	67.6
18.8	41.44	6.1	60.28	29.4	40.51	63.5	18.76	29.9	28.63	65.6
28.8	41.75	7.0	60.61	30.1	41.22	61.5	19.12	30.3	28.91	63.7
Aug. 7.8	42.07	8.1	60.95	30.9	42.00	60.1	19.49	31.0	29.20	62.1
17.8	42.39	9.2	61.29	31.9	42.82	59.2	19.86	31.8	29.49	60.8
27.7	42.70	10.3	61.63	33.0	43.66	58.9	20.23	32.8	29.77	59.9
Sept. 6.7	43.00	11.4	61.95	34.1	44.48	59.3	20.59	33.9	30.05	59.3
16.7	43.29	12.4	62.26	35.2	45.26	60.3	20.93	35.1	30.32	59.2
26.6	43.56	13.4	62.55	36.3	45.99	61.9	21.26	36.4	30.57	59.4
Oct. 6.6	43.81	14.2	62.82	37.4	46.62	64.0	21.56	37.8	30.80	60.1
16.6	44.03	15.0	63.07	38.5	47.16	66.6	21.83	39.2	31.01	61.1
26.6	44.23	15.7	63.29	39.6	47.56	69.6	22.07	40.6	31.19	62.4
Nov. 5.5	44.40	16.3	63.48	40.6	47.83	72.9	22.28	42.1	31.34	63.9
15.5	44.54	16.8	63.63	41.5	47.95	76.3	22.46	43.5	31.46	65.7
25.5	44.64	17.2	63.75	42.4	47.92	79.7	22.59	44.8	31.55	67.5
Dec. 5.5	44.71	17.5	63.83	43.2	47.73	83.1	22.68	46.1	31.61	69.4
15.4	44.74	17.8	63.87	43.9	47.40	86.2	22.72	47.3	31.63	71.3
25.4	44.73	17.9	63.86	44.5	46.93	89.0	22.71	48.3	31.61	73.1
35.4	44.68	18.0	63.81	45.0	46.35	91.4	22.65	49.2	31.55	74.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	A¹ Tauri Right Ascension	A¹ Tauri Declination North	c Persei Right Ascension	c Persei Declination North	o¹ Eridani Right Ascension	o¹ Eridani Declination South	γ Tauri Right Ascension	γ Tauri Declination North	ε Tauri Right Ascension	ε Tauri Declination North
	h m 3 58	° ' +21 48	h m 4 01	° ' +47 26	h m 4 07	° ' − 7 05	h m 4 14	° ' +15 23	h m 4 22	° ' +18 57
	s	"	s	"	s	"	s	"	s	"
Jan 0.4	56.07 (.06)	51.1 (0.1)	35.53 (.09)	68.1 (1.1)	6.63 (.06)	41.7 (1.3)	14.92 (.04)	25.4 (0.3)	55.68 (.04)	45.2 (0.2)
10.4	56.01 (.09)	51.0 (0.1)	35.44 (.15)	69.2 (0.9)	6.57 (.09)	43.0 (1.1)	14.88 (.08)	25.1 (0.4)	55.64 (.08)	45.0 (0.2)
20.4	55.92 (.13)	50.9 (0.2)	35.29 (.19)	70.1 (0.6)	6.48 (.13)	44.1 (1.0)	14.80 (.12)	24.7 (0.4)	55.56 (.11)	44.8 (0.2)
30.3	55.79 (.16)	50.7 (0.3)	35.10 (.23)	70.7 (0.2)	6.35 (.15)	45.1 (0.8)	14.68 (.14)	24.3 (0.3)	55.45 (.14)	44.6 (0.3)
Feb 9.3	55.63 (.17)	50.4 (0.4)	34.87 (.26)	70.9 (0.1)	6.20 (.17)	45.9 (0.5)	14.54 (.17)	24.0 (0.4)	55.31 (.17)	44.3 (0.3)
19.3	55.46 (.19)	50.0 (0.4)	34.61 (.26)	70.8 (0.4)	6.03 (.18)	46.4 (0.3)	14.37 (.18)	23.6 (0.4)	55.14 (.18)	44.0 (0.3)
Mar 1.2	55.27 (.18)	49.6 (0.5)	34.35 (.26)	70.4 (0.8)	5.85 (.18)	46.7 (0.0)	14.19 (.18)	23.2 (0.3)	54.96 (.19)	43.7 (0.4)
11.2	55.09 (.17)	49.1 (0.6)	34.09 (.24)	69.6 (1.0)	5.67 (.17)	46.7 (0.2)	14.01 (.17)	22.9 (0.4)	54.77 (.18)	43.3 (0.4)
21.2	54.92 (.15)	48.5 (0.5)	33.85 (.22)	68.6 (1.3)	5.50 (.15)	46.5 (0.5)	13.84 (.15)	22.5 (0.3)	54.59 (.15)	42.9 (0.4)
31.2	54.77 (.11)	48.0 (0.5)	33.63 (.17)	67.3 (1.5)	5.35 (.12)	46.0 (0.7)	13.69 (.12)	22.2 (0.2)	54.44 (.14)	42.5 (0.3)
Apr 10.1	54.66 (.08)	47.5 (0.5)	33.46 (.11)	65.8 (1.6)	5.23 (.09)	45.3 (0.9)	13.57 (.09)	22.0 (0.1)	54.30 (.09)	42.2 (0.3)
20.1	54.58 (.03)	47.0 (0.4)	33.35 (.05)	64.2 (1.6)	5.14 (.05)	44.4 (1.1)	13.48 (.05)	21.9 (0.1)	54.21 (.06)	41.9 (0.2)
30.1	54.55 (.01)	46.6 (0.2)	33.30 (.01)	62.6 (1.6)	5.09 (.00)	43.3 (1.4)	13.43 (.00)	21.8 (0.2)	54.15 (.00)	41.7 (0.1)
May 10.0	54.56 (.07)	46.4 (0.2)	33.31 (.07)	61.0 (1.6)	5.09 (.04)	41.9 (1.5)	13.43 (.05)	22.0 (0.2)	54.15 (.04)	41.6 (0.0)
20.0	54.63 (.11)	46.3 (0.1)	33.38 (.14)	59.4 (1.4)	5.13 (.08)	40.4 (1.8)	13.48 (.09)	22.2 (0.4)	54.19 (.08)	41.6 (0.2)
30.0	54.74 (.16)	46.4 (0.2)	33.52 (.20)	58.0 (1.2)	5.21 (.13)	38.6 (1.8)	13.57 (.14)	22.6 (0.6)	54.27 (.14)	41.8 (0.3)
June 9.0	54.90 (.20)	46.6 (0.5)	33.72 (.26)	56.8 (1.0)	5.34 (.16)	36.8 (1.9)	13.71 (.18)	23.2 (0.7)	54.41 (.17)	42.1 (0.5)
18.9	55.10 (.23)	47.1 (0.5)	33.98 (.30)	55.8 (0.7)	5.50 (.20)	34.9 (2.0)	13.89 (.21)	23.9 (0.8)	54.58 (.21)	42.6 (0.6)
28.9	55.33 (.27)	47.6 (0.7)	34.28 (.34)	55.1 (0.5)	5.70 (.23)	32.9 (1.9)	14.10 (.25)	24.7 (1.0)	54.79 (.25)	43.2 (0.8)
July 8.9	55.60 (.29)	48.3 (0.9)	34.62 (.38)	54.6 (0.2)	5.93 (.26)	31.0 (1.8)	14.35 (.27)	25.7 (1.0)	55.04 (.26)	44.0 (0.8)
18.9	55.89 (.30)	49.2 (0.9)	35.00 (.40)	54.4 (0.1)	6.19 (.27)	29.2 (1.7)	14.62 (.28)	26.7 (1.0)	55.30 (.29)	44.8 (0.8)
28.8	56.19 (.31)	50.1 (1.0)	35.40 (.41)	54.5 (0.3)	6.46 (.28)	27.5 (1.6)	14.90 (.30)	27.7 (1.1)	55.59 (.30)	45.6 (0.9)
Aug 7.8	56.50 (.31)	51.1 (1.0)	35.81 (.41)	54.8 (0.6)	6.74 (.28)	25.9 (1.2)	15.20 (.30)	28.8 (1.0)	55.89 (.30)	46.5 (0.9)
17.8	56.81 (.31)	52.1 (1.0)	36.22 (.42)	55.4 (0.8)	7.02 (.29)	24.7 (1.0)	15.50 (.29)	29.8 (0.9)	56.19 (.31)	47.4 (0.9)
27.8	57.12 (.31)	53.1 (0.9)	36.64 (.40)	56.2 (1.0)	7.31 (.28)	23.7 (0.7)	15.79 (.30)	30.7 (0.8)	56.50 (.30)	48.3 (0.8)
Sept 6.7	57.43 (.29)	54.0 (0.9)	37.04 (.39)	57.2 (1.2)	7.59 (.27)	23.0 (0.3)	16.09 (.28)	31.5 (0.7)	56.80 (.29)	49.1 (0.6)
16.7	57.72 (.27)	54.9 (0.8)	37.43 (.37)	58.4 (1.4)	7.86 (.25)	22.7 (0.0)	16.37 (.27)	32.2 (0.5)	57.09 (.28)	49.7 (0.6)
26.7	57.99 (.26)	55.7 (0.7)	37.80 (.35)	59.8 (1.5)	8.11 (.24)	22.7 (0.4)	16.64 (.26)	32.7 (0.4)	57.37 (.27)	50.3 (0.5)
Oct 6.6	58.25 (.23)	56.4 (0.6)	38.15 (.32)	61.3 (1.6)	8.35 (.21)	23.1 (0.7)	16.90 (.24)	33.1 (0.3)	57.64 (.25)	50.8 (0.3)
16.6	58.48 (.21)	57.0 (0.5)	38.47 (.29)	62.9 (1.7)	8.56 (.20)	23.8 (1.0)	17.14 (.21)	33.4 (0.1)	57.89 (.23)	51.1 (0.2)
26.6	58.69 (.19)	57.5 (0.4)	38.76 (.25)	64.6 (1.8)	8.76 (.17)	24.8 (1.2)	17.35 (.19)	33.5 (0.1)	58.12 (.20)	51.3 (0.2)
Nov 5.6	58.88 (.15)	57.9 (0.3)	39.01 (.20)	66.4 (1.7)	8.93 (.13)	26.0 (1.4)	17.54 (.17)	33.4 (0.1)	58.32 (.17)	51.5 (0.0)
15.5	59.03 (.12)	58.2 (0.3)	39.21 (.16)	68.1 (1.8)	9.06 (.11)	27.4 (1.5)	17.71 (.13)	33.3 (0.2)	58.49 (.15)	51.5 (0.0)
25.5	59.15 (.09)	58.4 (0.2)	39.37 (.11)	69.9 (1.7)	9.17 (.07)	28.9 (1.6)	17.84 (.09)	33.1 (0.3)	58.64 (.11)	51.5 (0.1)
Dec 5.5	59.24 (.04)	58.6 (0.1)	39.48 (.05)	71.6 (1.6)	9.24 (.04)	30.5 (1.6)	17.93 (.06)	32.8 (0.3)	58.75 (.07)	51.4 (0.1)
15.4	59.28 (.01)	58.7 (0.0)	39.53 (.00)	73.2 (1.5)	9.28 (.00)	32.1 (1.5)	17.99 (.02)	32.5 (0.3)	58.82 (.03)	51.3 (0.1)
25.4	59.29 (.03)	58.7 (0.0)	39.53 (.07)	74.7 (1.3)	9.28 (.04)	33.6 (1.4)	18.01 (.02)	32.2 (0.3)	58.85 (.02)	51.2 (0.2)
35.4	59.26	58.7	39.46	76.0	9.24	35.0	17.99	31.9	58.83	51.0

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Mensæ. Right Ascension.	δ Mensæ. Declination South.	m Persei. Right Ascension.	m Persei. Declination North.	α Tauri. (Aldebaran.) Right Ascension.	α Tauri. Declination North.	τ Tauri. Right Ascension.	τ Tauri. Declination North.	α Camelopardalis. Right Ascension.	α Camelopardalis. Declination North.
	h m 4 24 / s	−80 26 / ''	h m 4 26 / s	+42 51 / ° '	h m 4 30 / s	+16 18 / ''	h m 4 36 / s	+22 46 / ° '	h m 4 44 / s	+66 10 / ° '
Jan. 0.4	40.12 (0.99)	53.2 (2.5)	33.79 (.05)	18.7 (1.0)	19.84 (.03)	41.4 (0.3)	23.92 (.02)	6.2 (0.0)	23.00 (.12)	38.2 (2.2)
10.4	39.13 (1.17)	55.7 (2.0)	33.74 (.11)	19.7 (0.8)	19.81 (.07)	41.1 (0.3)	23.90 (.07)	6.2 (0.0)	22.88 (.22)	40.4 (1.9)
20.4	37.96 (1.30)	57.7 (1.4)	33.63 (.15)	20.5 (0.6)	19.74 (.11)	40.8 (0.3)	23.83 (.11)	6.2 (0.1)	22.66 (.31)	42.3 (1.6)
30.3	36.66 (1.40)	59.1 (0.9)	33.48 (.20)	21.1 (0.4)	19.63 (.14)	40.5 (0.3)	23.72 (.15)	6.1 (0.1)	22.35 (.38)	43.9 (1.1)
Feb. 9.3	35.26 (1.47)	60.0 (0.4)	33.28 (.22)	21.5 (0.1)	19.49 (.17)	40.2 (0.3)	23.57 (.17)	6.0 (0.2)	21.97 (.44)	45.0 (0.7)
19.3	33.79 (1.48)	60.4 (0.2)	33.06 (.24)	21.6 (0.3)	19.32 (.18)	39.9 (0.4)	23.40 (.19)	5.8 (0.3)	21.53 (.47)	45.7 (0.1)
Mar. 1.3	32.31 (1.46)	60.2 (0.8)	32.82 (.25)	21.3 (0.5)	19.14 (.18)	39.5 (0.3)	23 21 (.19)	5.5 (0.4)	21.06 (.48)	45.8 (0.3)
11.2	30.85 (1.41)	59.4 (1.2)	32.57 (.24)	20.8 (0.7)	18.96 (.18)	39.2 (0.4)	23.02 (.18)	5.1 (0.4)	20.58 (.46)	45.5 (0.7)
21.2	29.44 (1.32)	58.2 (1.8)	32.33 (.21)	20.1 (1.0)	18.78 (.16)	38.8 (0.3)	22.84 (.17)	4.7 (0.4)	20.12 (.43)	44.8 (1.3)
31.2	28.12 (1.20)	56.4 (2.2)	32.12 (.17)	19.1 (1.2)	18.62 (.13)	38.5 (0.2)	22.67 (.15)	4.3 (0.5)	19.69 (.38)	43.5 (1.6)
Apr. 10.1	26.92 (1.05)	54.2 (2.5)	31.95 (.13)	17.9 (1.3)	18.49 (.10)	38.3 (0.2)	22.52 (.10)	3.8 (0.4)	19.31 (.29)	41.9 (1.9)
20.1	25.87 (0.88)	51.7 (2.9)	31.82 (.08)	16.6 (1.3)	18.39 (.06)	38.1 (0.0)	22.42 (.07)	3.4 (0.4)	19.02 (.21)	40.0 (2.2)
30.1	24.99 (0.68)	48.8 (3.1)	31.74 (.02)	15.3 (1.4)	18.33 (.02)	38.1 (0.0)	22.35 (.02)	3.0 (0.3)	18.81 (.11)	37.8 (2.3)
May 10.1	24.31 (0.48)	45.7 (3.3)	31.72 (.05)	13.9 (1.3)	18.31 (.03)	38.1 (0.2)	22.33 (.03)	2.7 (0.2)	18.70 (.01)	35.5 (2.4)
20.0	23.83 (0.25)	42.4 (3.4)	31.77 (.10)	12.6 (1.2)	18.34 (.08)	38.3 (0.3)	22.36 (.07)	2.5 (0.0)	18.69 (.09)	33.1 (2.3)
30.0	23.58 (0.03)	39.0 (3.4)	31.87 (.16)	11.4 (1.1)	18.42 (.13)	38.6 (0.5)	22.43 (.13)	2.5 (0.0)	18.78 (.20)	30.8 (2.3)
June 9.0	23.55 (0.19)	35.6 (3.4)	32.03 (.21)	10.3 (0.9)	18.55 (.16)	39.1 (0.6)	22.56 (.17)	2.5 (0.2)	18.98 (.29)	28.5 (2.2)
19.0	23.74 (0.41)	32.2 (3.2)	32.24 (.26)	9.4 (0.7)	18.71 (.21)	39.7 (0.7)	22.73 (.20)	2.7 (0.4)	19.27 (.38)	26.3 (1.9)
28.9	24.15 (0.62)	29.0 (2.9)	32.50 (.30)	8.7 (0.4)	18.92 (.23)	40.4 (0.8)	22.93 (.24)	3.1 (0.4)	19.65 (.46)	24.4 (1.7)
July 8.9	24.77 (0.81)	26.1 (2.7)	32.80 (.33)	8.3 (0.3)	19.15 (.26)	41.2 (0.9)	23.17 (.26)	3.5 (0.6)	20.11 (.52)	22.7 (1.3)
18.9	25.58 (0.97)	23.4 (2.2)	33.13 (.36)	8.0 (0.0)	19.41 (.28)	42.1 (0.9)	23.43 (.29)	4.1 (0.7)	20.63 (.58)	21.4 (1.1)
28.9	26.55 (1.11)	21.2 (1.8)	33.49 (.37)	8.0 (0.2)	19.69 (.29)	43.0 (0.9)	23.72 (.30)	4.8 (0.7)	21.21 (.62)	20.3 (0.7)
Aug. 7.8	27.66 (1.21)	19.4 (1.2)	33.86 (.39)	8.2 (0.4)	19.98 (.29)	43.9 (0.9)	24.02 (.31)	5.5 (0.7)	21.83 (.64)	19.6 (0.3)
17.8	28.87 (1.28)	18.2 (0.7)	34.25 (.38)	8.6 (0.5)	20.27 (.30)	44.8 (0.8)	24.33 (.31)	6.2 (0.7)	22.47 (.66)	19.3 (0.0)
27.8	30.15 (1.30)	17.5 (0.1)	34.63 (.39)	9.1 (0.8)	20.57 (.30)	45.6 (0.8)	24.64 (.31)	6.9 (0.7)	23.13 (.66)	19.3 (0.4)
Sept. 6.7	31.45 (1.28)	17.4 (0.6)	35.02 (.37)	9.9 (0.9)	20.87 (.29)	46.4 (0.6)	24.95 (.30)	7.6 (0.6)	23.79 (.66)	19.7 (0.7)
16.7	32.73 (1.22)	18.0 (1.2)	35.39 (.36)	10.8 (1.0)	21.16 (.28)	47.0 (0.5)	25.25 (.30)	8.2 (0.6)	24.45 (.65)	20.4 (1.0)
26.7	33.95 (1.11)	19.2 (1.8)	35.75 (.34)	11.8 (1.1)	21.44 (.27)	47.5 (0.3)	25.55 (.28)	8.8 (0.5)	25.10 (.61)	21.4 (1.4)
Oct. 6.7	35.06 (0.97)	21.0 (2.3)	36.09 (.32)	12.9 (1.2)	21.71 (.25)	47.8 (0.2)	25.83 (.26)	9.3 (0.4)	25.71 (.58)	22.8 (1.6)
16.6	36.03 (0.79)	23.3 (2.8)	36.41 (.30)	14.1 (1.3)	21.96 (.23)	48.0 (0.1)	26.09 (.25)	9.7 (0.3)	26.29 (.54)	24.4 (2.0)
26.6	36.82 (0.57)	26.1 (3.1)	36.71 (.26)	15.4 (1.3)	22.19 (.20)	48.1 (0.1)	26.34 (.22)	10.0 (0.3)	26.83 (.47)	26.4 (2.1)
Nov. 5.6	37.39 (0.35)	29.2 (3.3)	36.97 (.23)	16.7 (1.4)	22.39 (.18)	48.0 (0.1)	26.56 (.19)	10.3 (0.2)	27.30 (.40)	28.5 (2.4)
15.5	37.74 (0.09)	32.5 (3.4)	37.20 (.18)	18.1 (1.4)	22.57 (.15)	47.9 (0.1)	26.75 (.16)	10.5 (0.2)	27.70 (.33)	30.9 (2.5)
25.5	37.83 (0.16)	35.9 (3.4)	37.38 (.14)	19.5 (1.4)	22.72 (.11)	47.6 (0.2)	26.91 (.13)	10.7 (0.1)	28.03 (.24)	33.4 (2.5)
Dec. 5.5	37.67 (0.41)	39.3 (3.3)	37.52 (.08)	20.9 (1.4)	22.83 (.08)	47.4 (0.3)	27.04 (.08)	10.8 (0.1)	28.27 (.14)	35.9 (2.6)
15.5	37.26 (0.65)	42.6 (3.1)	37.60 (.03)	22.3 (1.3)	22.91 (.03)	47.1 (0.3)	27.12 (.05)	10.9 (0.1)	28.41 (.04)	38.5 (2.5)
25.4	36.61 (0.87)	45.7 (2.7)	37.63 (.02)	23.6 (1.1)	22.94 (.00)	46.8 (0.3)	27.17 (.00)	11.0 (0.1)	28.45 (.06)	41.0 (2.3)
35.4	35.74	48.4	37.61	24.7	22.94	46.5	27.17	11.1	28.39	43.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	i Tauri. Right Ascension. h m 4 45	Declination North. ° ' +18 40	ι Aurigæ. Right Ascension. h m 4 50	Declination North. ° ' +33 00	ζ Aurigæ. Right Ascension. h m 4 55	Declination North. ° ' +40 55	11 Orionis. Right Ascension. h m 4 58	Declination North. ° ' +15 15	β Eridani. Right Ascension. h m 5 03	Declination South. ° ' −5 12
Jan. 0.4	40.55	19.9	39.08	38.1	40.31	57.8	60.24	59.1	3.85	54.7
10.4	40.53	19.7	39.06	38.7	40.29	58.8	60.23	58.7	3.84	56.1
20.4	40.47	19.5	38.99	39.2	40.21	59.7	60.18	58.3	3.78	57.4
30.4	40.37	19.3	38.88	39.6	40.09	60.4	60.09	58.0	3.68	58.5
Feb. 9.3	40.24	19.1	38.72	39.8	39.92	60.9	59.96	57.7	3.55	59.4
19.3	40.07	18.8	38.54	39.9	39.71	61.2	59.80	57.5	3.39	60.1
Mar. 1.3	39.89	18.6	38.34	39.8	39.48	61.2	59.63	57.2	3.22	60.6
11.2	39.70	18.3	38.12	39.5	39.24	60.9	59.44	57.0	3.03	60.8
21.2	39.52	18.0	37.91	39.0	39.00	60.4	59.26	56.7	2.85	60.8
31.2	39.35	17.7	37.72	38.4	38.78	59.7	59.09	56.5	2.67	60.6
Apr. 10.2	39.21	17.4	37.55	37.7	38.59	58.8	58.94	56.4	2.52	60.1
20.1	39.09	17.1	37.42	36.9	38.44	57.7	58.82	56.3	2.39	59.4
30.1	39.02	17.0	37.33	36.1	38.34	56.6	58.73	56.3	2.30	58.5
May 10.1	38.99	16.9	37.30	35.3	38.29	55.4	58.69	56.4	2.25	57.4
20.1	39.01	16.9	37.31	34.5	38.29	54.2	58.70	56.6	2.24	56.1
30.0	39.08	17.1	37.38	33.8	38.36	53.1	58.75	56.9	2.27	54.7
June 9.0	39.19	17.4	37.50	33.2	38.48	52.0	58.85	57.4	2.35	53.1
19.0	39.34	17.8	37.67	32.8	38.66	51.1	58.98	57.9	2.46	51.4
28.9	39.54	18.3	37.88	32.5	38.88	50.3	59.16	58.6	2.62	49.7
July 8.9	39.76	18.9	38.12	32.3	39.14	49.7	59.37	59.3	2.81	47.9
18.9	40.01	19.6	38.40	32.3	39.44	49.3	59.61	60.1	3.02	46.2
28.9	40.29	20.3	38.70	32.5	39.77	49.1	59.87	60.9	3.26	44.6
Aug. 7.8	40.57	21.1	39.03	32.7	40.12	49.0	60.14	61.8	3.52	43.2
17.8	40.87	21.9	39.36	33.1	40.48	49.1	60.43	62.5	3.79	42.0
27.8	41.17	22.6	39.70	33.6	40.86	49.4	60.73	63.2	4.07	41.0
Sept. 6.8	41.47	23.2	40.04	34.1	41.23	49.8	61.02	63.8	4.35	40.3
16.7	41.77	23.8	40.37	34.7	41.60	50.4	61.31	64.2	4.63	39.9
26.7	42.06	24.2	40.70	35.3	41.97	51.1	61.60	64.5	4.90	39.9
Oct. 6.7	42.34	24.5	41.02	35.9	42.32	51.8	61.88	64.7	5.16	40.2
16.6	42.60	24.7	41.32	36.6	42.65	52.7	62.14	64.7	5.42	40.9
26.6	42.85	24.8	41.60	37.3	42.96	53.7	62.39	64.6	5.65	41.9
Nov. 5.6	43.07	24.8	41.85	38.0	43.25	54.7	62.62	64.4	5.87	43.2
15.6	43.27	24.8	42.08	38.7	43.50	55.8	62.83	64.1	6.06	44.5
25.5	43.43	24.6	42.27	39.4	43.72	56.9	63.00	63.7	6.22	46.0
Dec. 5.5	43.57	24.5	42.42	40.1	43.89	58.1	63.14	63.3	6.35	47.7
15.5	43.66	24.3	42.53	40.8	44.01	59.3	63.25	62.9	6.44	49.3
25.5	43.71	24.2	42.60	41.5	44.08	60.5	63.31	62.5	6.49	50.9
35.4	43.72	24.0	42.61	42.2	44.10	61.6	63.33	62.1	6.50	52.5

·(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Aurigæ. (Capella.) Right Ascension.	α Aurigæ. Declination North.	β Orionis. (Rigel.) Right Ascension.	β Orionis. Declination South.	τ Orionis. Right Ascension.	τ Orionis. Declination South.	β Tauri. Right Ascension.	β Tauri. Declination North.	χ Aurigæ. Right Ascension.	χ Aurigæ. Declination North.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	5 09	+45 53	5 09	− 8 18	5 12	− 6 56	5 20	+28 31	5 26	+32 07
	s	″	s	″	s	″	s	″	s	″
Jan. 0.4	29.86 .01	53.1 1.3	51.60 .01	61.5 1.6	52.82 .01	69.0 1.6	8.18 .01	25.0 0.4	23.41 .02	6.5 0.6
10.4	29.85 .07	54.4 1.2	51.59 .06	63.1 1.5	52.81 .05	70.6 1.4	8.19 .04	25.4 0.3	23.43 .03	7.1 0.5
20.4	29.78 .13	55.6 1.0	51.53 .09	64.6 1.2	52.76 .09	72.0 1.2	8.15 .09	25.7 0.3	23.40 .08	7.6 0.5
30.4	29.65 .18	56.6 0.8	51.44 .13	65.8 1.0	52.67 .13	73.2 1.0	8.06 .12	26.0 0.2	23.32 .13	8.1 0.4
Feb. 9.3	29.47 .22	57.4 0.4	51.31 .16	66.8 0.7	52.54 .15	74.2 0.7	7.94 .16	26.2 0.2	23.19 .17	8.5 0.2
19.3	29.25 .25	57.8 0.2	51.15 .18	67.5 0.5	52.39 .18	74.9 0.5	7.78 .19	26.4 0.0	23.02 .19	8.7
Mar. 1.3	29.00 .26	58.0 0.1	50.97 .19	68.0 0.3	52.21 .19	75.4 0.3	7.59 .21	26.4 0.2	22.83 .21	8.8 0.1
11.3	28.74 .26	57.9 0.4	50.78 .18	68.3 0.0	52.02 .18	75.7 0.0	7.38 .20	26.2 0.2	22.62 .22	8.8 0.0
21.2	28.48 .25	57.5 0.7	50.60 .18	68.3 0.3	51.84 .18	75.7 0.2	7.18 .20	26.0 0.2	22.40 .20	8.6 0.4
31.2	28.23 .22	56.8 0.9	50.42 .16	68.0 0.5	51.66 .17	75.5 0.5	6.98 .17	25.6 0.4	22.20 .19	8.2 0.5
Apr. 10.2	28.01 .18	55.9 1.2	50.26 .14	67.5 0.8	51.49 .13	75.0 0.7	6.81 .15	25.2 0.5	22.01 .15	7.7 0.6
20.1	27.83 .13	54.7 1.3	50.12 .10	66.7 1.0	51.36 .10	74.3 1.0	6.66 .10	24.7 0.6	21.86 .12	7.1 0.7
30.1	27.70 .07	53.4 1.4	50.02 .06	65.7 1.2	51.26 .06	73.3 1.1	6.56 .06	24.1 0.5	21.74 .07	6.4 0.7
May 10.1	27.63 .02	52.0 1.4	49.96 .02	64.5 1.4	51.20 .02	72.2 1.1	6.50 .02	23.6 0.5	21.67 .02	5.7 0.7
20.1	27.61 .95	50.6 1.4	49.94 .03	63.1 1.6	51.18 .02	70.8 1.4	6.48 .04	23.1 0 5	21.65 .03	5.0 0.6
30.0	27.66 .11	49.2 1.4	49.97 .07	61.5 1.7	51.20 .07	69.3 1.6	6.52 .08	22.6 0.4	21.68 .08	4.4 0.6
June 9.0	27.77 .17	47.8 1.4	50.04 .11	59.8 1.7	51.27 .07	67.7 1.6	6.60 .08	22.2 0.4	21.76 .08	3.8 0.6
19.0	27.94 .22	46.5 1.3	50.15 .11	58.0 1.8	51.38 .11	65.9 1.8	6.73 .13	21.9 0.3	21.89 .13	3.3 0.5
29.0	28.16 .27	45.4 1.1	50.29 .14	56.1 1.9	51.52 .14	64.1 1.8	6.91 .18	21.7 0.2	22.06 .17	2.8 0.5
July 8.9	28.43 .31	44.5 0.9	50.47 .18	54.2 1.9	51.70 .18	62.3 1.8	7.12 .21	21.7 0.0	22.27 .21	2.5 0.3
18.9	28.74 .34	43.7 0.8	50.68 .21	52.4 1.8	51.91 .21	60.6 1.7	7.36 .24	21.7 0.0	22.52 .25	2.3 0.2
28.9	29.08 .37	43.1 0.6	50.92 .24	50.7 1.7	52.14 .23	58.9 1.7	7.63 .27	21.8 0.1	22.79 .27	2.2 0.1
Aug. 7.8	29.45 .38	42.8 0.3	51.17 .25	49.1 1.6	52.39 .25	57.4 1.5	7.92 .29	22.0 0.1	23.09 .30	2.2 0.0
17.8	29.83 .40	42.6 0.3	51.44 .27	47.8 1.6	52.66 .27	56.1 1.3	8.23 .31	22.2 0.2	23.40 .31	2.3 0.1
27.8	30.23 .40	42.6 0.2	51.71 .27	46.8 1.3	52.93 .27	55.1 1.0	8.55 .32	22.2 0.2	23.73 .33	2.3 0.2
		0.0		1.0		0.7		22.5 0.3		2.5 0.2
Sept. 6.8	30.63 .40	42.8 0.4	51.99 .28	46.1 0.3	53.21 .28	54.4 0.3	8.87 .32	22.8 0.3	24.06 .34	2.7 0.2
16.7	31.03 .40	43.2 0.5	52.27 .28	45.8 0.0	53.49 .28	54.1 0.0	9.19 .32	23.1 0.3	24.40 .33	2.9 0.3
26.7	31.43 .39	43.7 0.7	52.55 .27	45.8 0.4	53.77 .27	54.1 0.4	9.51 .32	23.4 0.3	24.73 .33	3.2 0.3
Oct. 6.7	31.82 .37	44.4 0.8	52.82 .25	46.2 0.7	54.04 .25	54.5 0.7	9.83 .30	23.7 0.3	25.06 .32	3.5 0.3
16.7	32.19 .35	45.2 1.0	53.07 .24	46.9 1.1	54.29 .24	55.2 1.0	10.13 .29	24.0 0.2	25.38 .30	3.8 0.4
26.6	32.54 .32	46.2 1.1	53.31 .22	48.0 1.3	54.53 .23	56.2 1.3	10.42 .27	24.2 0.3	25.68 .29	4.2 0.3
Nov. 5.6	32.86 .29	47.3 1.1	53.53 .20	49.3 1.6	54.76 .23	57.5 1.3	10.69 .25	24.5 0.3	25.97 .26	4.5 0.5
15.6	33.15 .25	48.6 1.3	53.73 .20	50.9 1.6	54.96 .20	59.0 1.5	10.94 .21	24.8 0.3	26.23 .22	5.0 0.5
25.5	33.40 .20	49.9 1.3	53.89 .16	52.6 1.7	55.13 .17	60.7 1.7	11.15 .18	25.1 0.3	26.45 .19	5.4 0.4
Dec. 5.5	33.60 .15	51.3 1.4	54.02 .13	54.5 1.7	55.26 .13	62.4 1.7	11.33 .14	25.4 0.3	26.64 .15	6.0 0.6
		1.4		1.9		1.8		0.3		0.5
15.5	33.75 .09	52.7 1.5	54.12 .06	56.3 1.8	55.36 .06	64.2 1.7	11.47 .09	25.7 0.4	26.79 .11	6.5 0.6
25.5	33.84 .03	54.2 1.4	54.18 .01	58.1 1.8	55.42 .02	65.9 1.7	11.56 .09	26.1 0.4	26.90 .05	7.1 0.6
35.4	33.87	55.6 1.4	54.19 .01	59.8 1.7	55.44 .02	67.6 1.7	11.60 .04	26.5 0.4	26.95	7.7 0.6

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 966. Right Ascension.	Groombridge 966. Declination North.	δ Orionis. Right Ascension.	δ Orionis. Declination South.	α Leporis. Right Ascension.	α Leporis. Declination South.	Groombridge 944. Right Ascension.	Groombridge 944. Declination North.	ε Orionis. Right Ascension.	ε Orionis. Declination South.
	h m 5 26	° ′ +74 58	h m 5 27	° ′ − 0 22	h m 5 28	° ′ −17 53	h m 5 30	° ′ +85 08	h m 5 31	° ′ − 1 15
	s	″	s	″	s	″	s	″	s	″
Jan. 0.5	44.15 (0.10)	44.6 (2.7)	1.99 (.01)	25.5 (1.3)	26.44 (.01)	42.1 (2.1)	52.31 (0.44)	53.5 (3.1)	16.45 (.01)	59.8 (1.3)
10.4	44.05 (0.25)	47.3 (2.5)	2.00 (.03)	26.8 (1.1)	26.43 (.05)	44.2 (1.9)	51.87 (0.93)	56.6 (2.8)	16.46 (.03)	61.1 (1.2)
20.4	43.80 (0.41)	49.8 (2.2)	1.97 (.08)	27.9 (1.0)	26.38 (.09)	46.1 (1.7)	50.94 (1.38)	59.4 (2.5)	16.43 (.08)	62.3 (1.0)
30.4	43.39 (0.54)	52.0 (1.8)	1.89 (.11)	28.9 (0.8)	26.29 (.14)	47.8 (1.4)	49.56 (1.78)	61.9 (2.1)	16.35 (.11)	63.3 (0.9)
Feb. 9.3	42.85 (0.65)	53.8 (1.4)	1.78 (.15)	29.7 (0.7)	26.15 (.16)	49.2 (1.0)	47.78 (2.10)	64.0 (1.6)	16.24 (.14)	64.2 (0.6)
19.3	42.20 (0.73)	55.2 (0.8)	1.63 (.17)	30.4 (0.4)	25.99 (.19)	50.2 (0.7)	45.68 (2.34)	65.6 (1.0)	16.10 (.17)	64.8 (0.5)
Mar. 1.3	41.47 (0.77)	56.0 (0.3)	1.46 (.18)	30.8 (0.3)	25.80 (.20)	50.9 (0.3)	43.34 (2.45)	66.6 (0.5)	15.93 (.18)	65.3 (0.3)
11.3	40.70 (0.78)	56.3 (0.2)	1.28 (.18)	31.1 (0.1)	25.60 (.21)	51.2 (0.1)	40.89 (2.48)	67.1 (0.2)	15.75 (.19)	65.6 (0.1)
21.2	39.92 (0.75)	56.1 (0.8)	1.10 (.18)	31.2 (0.1)	25.39 (.19)	51.3 (0.4)	38.41 (2.40)	66.9 (0.8)	15.56 (.18)	65.7 (0.1)
31.2	39.17 (0.68)	55.3 (1.3)	0.92 (.16)	31.1 (0.3)	25.20 (.18)	50.9 (0.6)	36.01 (2.22)	66.1 (1.3)	15.38 (.16)	65.6 (0.3)
Apr. 10.2	38.49 (0.60)	54.0 (1.7)	0.76 (.14)	30.8 (0.5)	25.02 (.16)	50.3 (1.0)	33.79 (1.95)	64.8 (1.9)	15.22 (.14)	65.3 (0.5)
20.2	37.89 (0.47)	52.3 (2.1)	0.62 (.11)	30.3 (0.6)	24.86 (.12)	49.3 (1.2)	31.84 (1.62)	62.9 (2.2)	15.08 (.11)	64.8 (0.6)
30.1	37.42 (0.34)	50.2 (2.3)	0.51 (.06)	29.7 (0.8)	24.74 (.09)	48.1 (1.6)	30.22 (1.22)	60.7 (2.6)	14.97 (.07)	64.2 (0.9)
May 10.1	37.08 (0.20)	47.9 (2.6)	0.45 (.03)	28.9 (1.0)	24.65 (.05)	46.5 (1.7)	29.00 (0.79)	58.1 (2.8)	14.90 (.03)	63.3 (1.0)
20.1	36.88 (0.04)	45.3 (2.7)	0.42 (.02)	27.9 (1.1)	24.60 (.00)	44.8 (2.0)	28.21 (0.34)	55.3 (3.0)	14.87 (.01)	62.3 (1.2)
30.0	36.84 (0.11)	42.6 (2.7)	0.44 (.06)	26.8 (1.3)	24.60 (.05)	42.8 (2.1)	27.87 (0.13)	52.3 (3.0)	14.88 (.05)	61.1 (1.3)
June 9.0	36.95 (0.27)	39.9 (2.7)	0.50 (.10)	25.5 (1.4)	24.65 (.08)	40.7 (2.3)	28.00 (0.58)	49.3 (3.0)	14.93 (.10)	59.8 (1.4)
19.0	37.22 (0.41)	37.2 (2.5)	0.60 (.13)	24.1 (1.4)	24.73 (.13)	38.4 (2.2)	28.58 (1.03)	46.3 (2.9)	15.03 (.13)	58.4 (1.4)
29.0	37.63 (0.54)	34.7 (2.4)	0.73 (.18)	22.7 (1.5)	24.86 (.16)	36.2 (2.3)	29.61 (1.44)	43.4 (2.7)	15.16 (.17)	57.0 (1.5)
July 8.9	38.17 (0.66)	32.3 (2.1)	0.91 (.20)	21.2 (1.4)	25.02 (.19)	33.9 (2.2)	31.05 (1.80)	40.7 (2.5)	15.33 (.20)	55.5 (1.5)
18.9	38.83 (0.76)	30.2 (1.8)	1.11 (.22)	19.8 (1.4)	25.21 (.22)	31.7 (2.0)	32.85 (2.14)	38.2 (2.1)	15.53 (.22)	54.0 (1.4)
28.9	39.59 (0.85)	28.4 (1.5)	1.33 (.25)	18.4 (1.2)	25.43 (.24)	29.7 (1.9)	34.99 (2.43)	36.1 (1.8)	15.75 (.24)	52.6 (1.3)
Aug. 7.9	40.44 (0.91)	26.9 (1.1)	1.58 (.26)	17.2 (1.1)	25.67 (.27)	27.8 (1.5)	37.42 (2.65)	34.3 (1.4)	15.99 (.26)	51.3 (1.1)
17.8	41.35 (0.97)	25.8 (0.8)	1.84 (.27)	16.1 (0.9)	25.94 (.27)	26.3 (1.2)	40.07 (2.83)	32.9 (1.0)	16.25 (.27)	50.2 (0.9)
27.8	42.32 (1.00)	25.0 (0.4)	2.11 (.28)	15.2 (0.6)	26.21 (.28)	25.1 (0.8)	42.90 (2.95)	31.9 (0.5)	16.52 (.28)	49.3 (0.6)
Sept. 6.8	43.32 (1.02)	24.6 (0.0)	2.39 (.28)	14.6 (0.3)	26.49 (.29)	24.3 (0.4)	45.85 (3.02)	31.4 (0.1)	16.80 (.28)	48.7 (0.3)
16.7	44.34 (1.02)	24.6 (0.5)	2.67 (.28)	14.3 (0.1)	26.78 (.28)	23.9 (0.1)	48.87 (3.02)	31.3 (0.4)	17.08 (.28)	48.4 (0.1)
26.7	45.36 (0.99)	25.1 (0.8)	2.95 (.27)	14.2 (0.1)	27.06 (.28)	24.0 (0.5)	51.89 (2.97)	31.7 (0.4)	17.36 (.27)	48.3 (0.3)
Oct. 6.7	46.35 (0.96)	25.9 (1.2)	3.22 (.27)	14.5 (0.3)	27.34 (.26)	24.5 (1.0)	54.86 (2.85)	32.5 (0.8)	17.63 (.27)	48.6 (0.6)
16.7	47.31 (0.90)	27.1 (1.6)	3.49 (.25)	15.0 (0.5)	27.60 (.26)	25.5 (1.4)	57.71 (2.68)	33.8 (1.3)	17.90 (.25)	49.2 (0.8)
26.6	48.21 (0.83)	28.7 (2.0)	3.74 (.23)	15.8 (1.1)	27.86 (.23)	26.9 (1.7)	60.39 (2.43)	35.5 (2.1)	18.15 (.24)	50.0 (1.1)
Nov. 5.6	49.04 (0.73)	30.7 (2.2)	3.97 (.22)	16.9 (1.2)	28.09 (.21)	28.6 (2.0)	62.82 (2.13)	37.6 (2.4)	18.39 (.21)	51.1 (1.3)
15.6	49.77 (0.62)	32.9 (2.5)	4.19 (.18)	18.1 (1.3)	28.30 (.18)	30.6 (2.2)	64.95 (1.77)	40.0 (2.8)	18.60 (.19)	52.4 (1.4)
25.6	50.39 (0.48)	35.4 (2.7)	4.37 (.16)	19.4 (1.5)	28.48 (.15)	32.8 (2.3)	66.72 (1.34)	42.8 (3.0)	18.79 (.16)	53.8 (1.5)
Dec. 5.5	50.87 (0.33)	38.1 (2.9)	4.53 (.11)	20.9 (1.4)	28.63 (.10)	35.1 (2.4)	68.06 (0.88)	45.8 (3.2)	18.95 (.12)	55.3 (1.5)
15.5	51.20 (0.18)	41.0 (2.8)	4.64 (.08)	22.3 (1.4)	28.73 (.07)	37.5 (2.4)	68.94 (0.39)	49.0 (3.2)	19.07 (.08)	56.8 (1.5)
25.5	51.38 (0.00)	43.8 (2.8)	4.72 (.04)	23.7 (1.3)	28.80 (.02)	39.9 (2.2)	69.33 (0.13)	52.2 (3.1)	19.15 (.04)	58.3 (1.4)
35.4	51.38	46.6	4.76	25.0	28.82	42.1	69.20	55.3	19.19	59.7

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Columbæ. Right Ascension.	Declination South.	κ Orionis. Right Ascension.	Declination South.	δ Doradus. Right Ascension.	Declination South.	ν Aurigæ. Right Ascension.	Declination North.	α Orionis. Right Ascension.	Declination North.
	h m 5 36	° ′ −34 07	h m 5 43	° ′ −9 42	h m 5 44	° ′ −65 46	h m 5 44	° ′ +39 07	h m 5 49	° ′ +7 23
	s	″	s	″	s	″	s	″	s	″
Jan. 0.5	8.09 .03	45.5 2.8	8.52 .02	24.6 1.8	38.97 .18	32.1 3.4	44.55 .04	6.7 1.0	54.08 .03	12.2 0.9
10.4	8.06 .08	48.3 2.5	8.54 .03	26.4 1.7	38.79 .28	35.5 3.0	44.59 .02	7.7 0.9	54.11 .01	11.3 0.8
20.4	7.98 .13	50.8 2.2	8.51 .08	28.1 1.4	38.51 .36	38.5 2.7	44.57 .07	8.6 0.9	54.10 .06	10.5 0.6
30.4	7.85 .17	53.0 1.8	8.43 .11	29.5 1.2	38.15 .44	41.2 2.2	44.50 .13	9.5 0.7	54.04 .09	9.9 0.6
Feb. 9.4	7.68 .20	54.8 1.4	8.32 .15	30.7 0.9	37.71 .50	43.4 1.7	44.37 .17	10.2 0.6	53.95 .13	9.3 0.4
19.3	7.48 .23	56.2 0.9	8.17 .17	31.6 0.6	37.21 .53	45.1 1.1	44.20 .21	10.8 0.4	53.82 .16	8.9 0.4
Mar. 1.3	7.25 .25	57.1 0.5	8.00 .18	32.2 0.4	36.68 .57	46.2 0.6	43.99 .23	11.2 0.2	53.66 .18	8.5 0.2
11.3	7.00 .25	57.6 0.0	7.82 .20	32.6 0.1	36.11 .57	46.8 0.1	43.76 .24	11.4 0.1	53.48 .19	8.3 0.1
21.2	6.75 .24	57.6 0.4	7.62 .18	32.7 0.1	35.54 .57	46.9 0.5	43.52 .23	11.3 0.3	53.29 .18	8.2 0.0
31.2	6.51 .23	57.2 0.9	7.44 .18	32.6 0.5	34.97 .53	46.4 1.0	43.29 .21	11.0 0.5	53.11 .17	8.2 0.1
Apr. 10.2	6.28 .20	56.3 1.3	7.26 .15	32.1 0.6	34.44 .50	45.4 1.5	43.08 .18	10.5 0.7	52.94 .14	8.3 0.3
20.2	6.08 .17	55.0 1.6	7.11 .12	31.5 1.0	33.94 .44	43.9 1.9	42.90 .15	9.8 0.7	52.80 .12	8.6 0.3
30.1	5.91 .12	53.4 2.0	6.99 .09	30.5 1.1	33.50 .38	42.0 2.4	42.75 .09	8.9 0.9	52.68 .08	8.9 0.4
May 10.1	5.79 .08	51.4 2.3	6.90 .05	29.4 1.1	33.12 .29	39.6 2.7	42.66 .05	8.0 1.0	52.60 .04	9.3 0.6
20.1	5.71 .04	49.1 2.5	6.85 .00	28.0 1.4	32.83 .22	36.9 3.0	42.61 .01	7.0 1.1	52.56 .00	9.9 0.7
30.1	5.67 .01	46.6 2.7	6.85 .03	26.5 1.7	32.61 .13	33.9 3.2	42.62 .06	5.9 1.0	52.56 .05	10.6 0.8
June 9.0	5.68 .06	43.9 2.9	6.88 .08	24.8 1.8	32.48 .03	30.7 3.3	42.68 .12	4.9 0.9	52.61 .08	11.4 0.8
19.0	5.74 .11	41.0 2.9	6.96 .12	23.0 1.9	32.45 .06	27.4 3.4	42.80 .16	4.0 0.9	52.69 .12	12.2 0.9
29.0	5.85 .15	38.1 2.8	7.08 .15	21.1 1.9	32.51 .15	24.0 3.4	42.96 .21	3.1 0.8	52.81 .16	13.1 1.0
July 8.9	6.00 .19	35.3 2.8	7.23 .18	19.2 1.8	32.66 .23	20.6 3.2	43.17 .25	2.3 0.7	52.97 .19	14.1 1.0
18.9	6.19 .22	32.5 2.5	7.41 .21	17.4 1.7	32.89 .32	17.4 2.9	43.42 .28	1.6 0.6	53.16 .22	15.1 1.0
28.9	6.41 .25	30.0 2.2	7.62 .24	15.7 1.6	33.21 .38	14.5 2.6	43.70 .30	1.0 0.4	53.38 .23	16.1 0.8
Aug. 7.9	6.66 .28	27.8 1.9	7.86 .25	14.1 1.3	33.59 .45	11.9 2.3	44.00 .33	0.6 0.3	53.61 .26	16.9 0.8
17.8	6.94 .29	25.9 1.4	8.11 .26	12.8 1.1	34.04 .50	9.6 1.7	44.33 .35	0.3 0.2	53.87 .27	17.7 0.7
27.8	7.23 .31	24.5 1.0	8.37 .27	11.7 0.7	34.54 .54	7.9 1.1	44.68 .36	0.1 0.1	54.14 .27	18.4 0.4
Sept. 6.8	7.54 .31	23.5 0.4	8.64 .28	11.0 0.4	35.08 .56	6.8 0.5	45.04 .36	0.0 0.0	54.41 .29	18.8 0.3
16.8	7.85 .32	23.1 0.1	8.92 .28	10.6 0.4	35.64 .56	6.3 0.1	45.40 .36	0.0 0.0	54.70 .28	19.1 0.0
26.7	8.17 .31	23.2 0.1	9.20 .28	10.6 0.0	36.20 .56	6.4 0.1	45.76 .36	0.1 0.1	54.98 .28	19.1 0.2
Oct. 6.7	8.48 .29	23.9 0.7	9.48 .27	11.0 0.4	36.76 .53	7.2 0.8	46.12 .36	0.3 0.2	55.26 .28	18.9 0.2
16.7	8.77 .28	25.1 1.2	9.75 .26	11.7 0.7	37.29 .49	8.6 1.4	46.48 .34	0.6 0.3	55.54 .27	18.5 0.4
26.6	9.05 .25	26.8 1.7	10.01 .24	12.8 1.1	37.78 .43	10.7 2.1	46.82 .32	1.1 0.5	55.81 .26	17.9 0.6
Nov. 5.6	9.30 .23	29.0 2.2	10.25 .22	14.3 1.5	38.21 .36	13.2 2.5	47.14 .30	1.6 0.5	56.07 .23	17.1 0.8
15.6	9.53 .19	31.6 2.6	10.47 .20	15.9 1.6	38.57 .28	16.2 3.0	47.44 .27	2.2 0.6	56.30 .22	16.1 1.0
25.6	9.72 .15	34.4 2.8	10.67 .16	17.8 1.9	38.85 .19	19.5 3.3	47.71 .22	2.9 0.7	56.52 .18	15.1 1.0
Dec. 5.5	9.87 .10	37.4 3.0	10.83 .13	19.8 2.0	39.04 .09	23.1 3.6	47.93 .19	3.7 0.8	56.70 .15	14.1 1.0
15.5	9.97 .05	40.5 3.1	10.96 .09	21.8 2.0	39.13 .02	26.7 3.6	48.12 .13	4.7 1.0	56.85 .10	13.0 1.0
25.5	10.03 .00	43.5 3.0	11.05 .04	23.8 2.0	39.11 .12	30.3 3.6	48.25 .07	5.6 0.9	56.95 .06	12.0 1.0
35.5	10.03	46.4 2.9	11.09 .01	25.6 1.8	38.99 .12	33.8 3.5	48.32 .07	6.7 1.1	57.01 .06	11.1 0.9

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Aurigæ. Right Ascension.	β Aurigæ. Declination North.	θ Aurigæ. Right Ascension.	θ Aurigæ. Declination North.	ν Orionis. Right Ascension.	ν Orionis. Declination North.	22 Camelop. (H.) Right Ascension.	22 Camelop. (H.) Declination North.	η Geminorum. Right Ascension.	η Geminorum. Declination North.
	h m 5 52	° ′ +44 56	h m 5 53	° ′ +37 12	h m 6 01	° ′ +14 46	h m 6 08	° ′ +69 20	h m 6 08	° ′ +22 31
	s	″	s	″	s	″	s	″	s	″
Jan. 0.5	23.38 .05	10.4 1.3	4.96 .05	15.3 0.8	60.81 .05	41.2 0.5	8.28 .06	71.0 2.5	60.07 .06	59.4 0.0
10.4	23.43 .02	11.7 1.2	5.01 .01	16.1 0.9	60.86 .00	40.7 0.4	8.34 .06	73.5 2.5	60.13 .01	59.4 0.0
20.4	23.41 .08	12.9 1.2	5.00 .06	17.0 0.8	60.86 .04	40.3 0.4	8.28 .19	76.0 2.3	60.14 .04	59.4 0.1
30.4	23.33 .14	14.1 1.1	4.94 .12	17.8 0.7	60.82 .09	39.9 0.4	8.09 .30	78.3 2.0	60.10 .09	59.5 0.1
Feb. 9.4	23.19 .19	15.2 0.8	4.82 .16	18.5 0.6	60.73 .13	39.7 0.2	7.79 .40	80.3 1.7	60.01 .13	59.6 0.2
19.3	23.00 .22	16.0 0.5	4.66 .20	19.1 0.4	60.60 .15	39.5 0.1	7.39 .48	82.0 1.2	59.88 .16	59.8 0.1
Mar. 1.3	22.78 .25	16.5 0.3	4.46 .22	19.5 0.2	60.45 .18	39.4 0.1	6.91 .53	83.2 0.8	59.72 .18	59.9 0.0
11.3	22.53 .26	16.8 0.0	4.24 .23	19.7 0.1	60.27 .19	39.3 0.1	6.38 .56	84.0 0.3	59.54 .20	59.9 0.1
21.3	22.27 .26	16.8 0.2	4.01 .22	19.6 0.2	60.08 .19	39.2 0.0	5.82 .56	84.3 0.3	59.34 .19	60.0 0.1
31.2	22.01 .24	16.6 0.6	3.79 .21	19.4 0.4	59.89 .17	39.2 0.0	5.26 .53	84.0 0.7	59.15 .19	59.9 0.1
Apr. 10.2	21.77 .21	16.0 0.8	3.58 .18	19.0 0.6	59.72 .15	39.2 0.0	4.73 .48	83.3 1.1	58.96 .16	59.8 0.1
20.2	21.56 .17	15.2 1.0	3.40 .15	18.4 0.7	59.57 .13	39.2 0.1	4.25 .41	82.2 1.6	58.80 .13	59.7 0.2
30.1	21.39 .11	14.2 1.1	3.25 .10	17.7 0.8	59.44 .08	39.3 0.2	3.84 .32	80.6 1.9	58.67 .10	59.5 0.2
May 10.1	21.28 .07	13.1 1.3	3.15 .05	16.9 0.9	59.36 .05	39.5 0.2	3.52 .22	78.7 1.9	58.57 .05	59.3 0.2
20.1	21.21 .00	11.8 1.3	3.10 .00	16.0 1.0	59.31 .01	39.7 0.2	3.30 .11	76.6 2.1	58.52 .01	59.2 0.2
30.1	21.21 .05	10.5 1.4	3.10 .05	15.0 0.9	59.30 .04	39.9 0.4	3.19 .00	74.2 2.5	58.51 .03	59.0 0.1
June 9.0	21.26 .11	9.1 1.3	3.15 .10	14.1 0.9	59.34 .08	40.3 0.4	3.19 .11	71.7 2.5	58.54 .08	58.9 0.0
19.0	21.37 .17	7.8 1.2	3.25 .15	13.2 0.8	59.42 .11	40.7 0.5	3.30 .22	69.2 2.5	58.62 .11	58.9 0.0
29.0	21.54 .21	6.6 1.2	3.40 .20	12.4 0.7	59.53 .16	41.2 0.5	3.52 .32	66.7 2.5	58.73 .16	58.9 0.0
July 9.0	21.75 .26	5.4 1.0	3.60 .23	11.7 0.7	59.69 .19	41.7 0.5	3.84 .41	64.3 2.4	58.89 .19	58.9 0.1
18.9	22.01 .29	4.4 0.9	3.83 .27	11.0 0.5	59.88 .21	42.2 0.6	4.25 .50	62.0 2.0	59.08 .22	59.0 0.1
28.9	22.30 .33	3.5 0.7	4.10 .29	10.5 0.4	60.09 .24	42.8 0.5	4.75 .57	60.0 1.8	59.30 .24	59.1 0.2
Aug. 7.9	22.63 .35	2.8 0.7	4.39 .32	10.1 0.4	60.33 .26	43.3 0.5	5.32 .63	58.2 1.6	59.54 .27	59.3 0.1
17.8	22.98 .37	2.2 0.6	4.71 .33	9.7 0.2	60.59 .27	43.7 0.4	5.95 .68	56.6 1.3	59.81 .28	59.4 0.1
27.8	23.35 .39	1.7 0.5	5.04 .35	9.5 0.1	60.86 .28	44.1 0.4	6.63 .72	55.3 0.9	60.09 .29	59.5 0.0
Sept. 6.8	23.74 .39	1.4 0.3	5.39 .35	9.4 0.1	61.14 .29	44.4 0.1	7.35 .74	54.4 0.6	60.38 .31	59.5 0.0
16.8	24.13 .40	1.3 0.1	5.74 .36	9.3 0.0	61.43 .29	44.5 0.0	8.09 .76	53.8 0.2	60.69 .30	59.5 0.0
26.7	24.53 .39	1.3 0.0	6.10 .35	9.3 0.1	61.72 .30	44.5 0.2	8.85 .77	53.6 0.2	60.99 .31	59.4 0.1
Oct. 6.7	24.92 .39	1.5 0.2	6.45 .35	9.4 0.2	62.02 .29	44.3 0.2	9.62 .75	53.8 0.5	61.30 .31	59.2 0.2
16.7	25.31 .38	1.9 0.4	6.80 .34	9.6 0.3	62.31 .28	43.9 0.4	10.37 .73	54.3 0.9	61.61 .30	59.0 0.2
26.7	25.69 .36	2.4 0.5	7.14 .32	9.9 0.4	62.59 .27	43.5 0.6	11.10 .69	55.2 1.2	61.91 .29	58.7 0.3
Nov. 5.6	26.05 .33	3.0 0.6	7.46 .30	10.3 0.4	62.86 .26	42.9 0.6	11.79 .64	56.4 1.6	62.20 .27	58.4 0.3
15.6	26.38 .29	3.8 0.8	7.76 .27	10.7 0.6	63.12 .23	42.3 0.7	12.43 .56	58.0 1.9	62.47 .25	58.0 0.4
25.6	26.67 .26	4.8 1.0	8.03 .23	11.3 0.7	63.35 .20	41.6 0.7	12.99 .48	59.9 2.1	62.72 .22	57.7 0.3
Dec. 5.5	26.93 .20	5.9 1.1	8.26 .19	12.0 0.7	63.55 .16	40.9 0.6	13.47 .38	62.0 2.4	62.94 .18	57.5 0.2
15.5	27.13 .15	7.2 1.3	8.45 .14	12.7 0.8	63.71 .13	40.3 0.6	13.85 .26	64.4 2.6	63.12 .14	57.3 0.2
25.5	27.28 .08	8.5 1.3	8.59 .08	13.5 0.9	63.84 .08	39.7 0.5	14.11 .14	67.0 2.6	63.26 .09	57.1 0.0
35.5	27.36	9.8 1.3	8.67 .08	14.4	63.92 .08	39.2 0.5	14.25 .14	69.6 2.6	63.35	57.1 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Geminorum.		ψ¹ Aurigæ.		a Argûs. (Canopus.)		ν Geminorum.		γ Geminorum.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 6 17	° ′ +22 33	h m 6 17	° ′ +49 19	h m 6 21	° ′ −52 38	h m 6 23	° ′ +20 16	h m 6 32	° ′ +16 28
	s	″	s	″	s	″	s	″	s	″
Jan. 0.5	4.23 .07	42.5 0.1	24.27 .08	70.1 1.5	49.20 .02	41.3 3.4	10.93 .07	19.0 0.2	5.27 .08	49.9 0.4
10.5	4.30 .02	42.4 0.0	24.35 .01	71.6 1.6	49.18 .10	44.7 3.3	11.00 .03	18.8 0.1	5.35 .03	49.5 0.4
20.4	4.32 .03	42.4 0.1	24.36 .06	73.2 1.5	49.08 .16	48.0 2.9	11.03 .03	18.7 0.0	5.38 .02	49.1 0.2
30.4	4.29 .08	42.5 0.2	24.30 .13	74.7 1.3	48.92 .23	50.9 2.6	11.00 .08	18.7 0.1	5.36 .06	48.9 0.2
Feb. 9.4	4.21 .13	42.7 0.1	24.17 .18	76.0 1.2	48.69 .27	53.5 2.1	10.92 .11	18.7 0.1	5.30 .11	48.7 0.0
19.4	4.08 .15	42.8 0.1	23.99 .23	77.2 0.9	48.42 .32	55.6 1.6	10.81 .15	18.8 0.1	5.19 .14	48.7 0.1
Mar. 1.3	3.93 .19	42.9 0.1	23.76 .27	78.1 0.6	48.10 .34	57.2 1.1	10.66 .18	18.9 0.0	5.05 .17	48.6 0.1
11.3	3.74 .19	43.0 0.1	23.49 .28	78.7 0.3	47.76 .36	58.3 0.6	10.48 .19	18.9 0.1	4.88 .19	48.7 0.0
21.3	3.55 .19	43.1 0.0	23.21 .28	79.0 0.1	47.40 .37	58.9 0.1	10.29 .19	19.0 0.0	4.69 .19	48.7 0.0
31.2	3.36 .19	43.1 0.1	22.93 .28	78.9 0.4	47.03 .35	59.0 0.5	10.10 .19	19.0 0.0	4.50 .18	48.7 0.1
Apr. 10.2	3.17 .16	43.0 0.1	22.65 .24	78.5 0.7	46.68 .33	58.5 0.9	9.91 .16	19.0 0.1	4.32 .16	48.8 0.1
20.2	3.01 .14	42.9 0.1	22.41 .21	77.8 0.9	46.35 .30	57.6 1.5	9.75 .14	19.0 0.0	4.16 .14	48.9 0.0
30.2	2.87 .10	42.8 0.2	22.20 .16	76.9 1.2	46.05 .26	56.1 1.8	9.61 .10	18.9 0.0	4.02 .11	48.9 0.1
May 10.1	2.77 .06	42.6 0.2	22.04 .10	75.7 1.3	45.79 .21	54.3 2.3	9.51 .07	18.9 0.1	3.91 .07	49.0 0.2
20.1	2.71 .02	42.4 0.1	21.94 .04	74.4 1.5	45.58 .16	52.0 2.6	9.44 .02	18.8 0.0	3.84 .03	49.2 0.1
30.1	2.69 .02	42.3 0.1	21.90 .02	72.9 1.6	45.42 .09	49.4 2.9	9.42 .02	18.8 0.0	3.81 .01	49.3 0.2
June 9.1	2.71 .07	42.2 0.1	21.92 .08	71.3 1.6	45.33 .04	46.5 3.0	9.44 .06	18.8 0.1	3.82 .05	49.5 0.3
19.0	2.78 .11	42.1 0.0	22.00 .14	69.7 1.5	45.29 .03	43.5 3.2	9.50 .10	18.9 0.1	3.87 .09	49.8 0.3
29.0	2.89 .15	42.1 0.0	22.14 .19	68.2 1.5	45.32 .08	40.3 3.3	9.60 .14	19.0 0.1	3.96 .13	50.1 0.3
July 9.0	3.04 .18	42.1 0.0	22.33 .24	66.7 1.4	45.40 .15	37.0 3.2	9.74 .17	19.1 0.1	4.09 .16	50.4 0.4
18.9	3.22 .22	42.1 0.1	22.57 .29	65.3 1.3	45.55 .20	33.8 3.0	9.91 .21	19.2 0.2	4.25 .19	50.8 0.3
28.9	3.44 .24	42.2 0.1	22.86 .33	64.0 1.2	45.75 .25	30.8 2.7	10.12 .23	19.4 0.2	4.44 .22	51.1 0.3
Aug. 7.9	3.68 .26	42.2 0.0	23.19 .35	62.8 1.0	46.00 .29	28.1 2.4	10.35 .25	19.6 0.1	4.66 .24	51.4 0.2
17.9	3.94 .27	42.3 0.1	23.54 .39	61.8 0.8	46.29 .33	25.7 2.0	10.60 .27	19.7 0.0	4.90 .26	51.6 0.2
27.8	4.21 .29	42.3 0.0	23.93 .40	61.0 0.7	46.62 .36	23.7 1.5	10.87 .28	19.7 0.0	5.16 .27	51.8 0.0
Sept. 6.8	4.50 .31	42.3 0.1	24.33 .42	60.3 0.5	46.98 .39	22.2 0.9	11.15 .30	19.7 0.0	5.43 .29	51.8 0.1
16.8	4.81 .30	42.2 0.1	24.75 .42	59.8 0.3	47.37 .40	21.3 0.3	11.45 .30	19.7 0.2	5.72 .29	51.7 0.2
26.8	5.11 .31	42.1 0.3	25.17 .43	59.5 0.1	47.77 .41	21.0 0.3	11.75 .30	19.5 0.3	6.01 .30	51.5 0.3
Oct. 6.7	5.42 .31	41.8 0.3	25.60 .43	59.4 0.1	48.18 .40	21.3 1.0	12.05 .31	19.2 0.4	6.31 .30	51.2 0.5
16.7	5.73 .30	41.5 0.3	26.03 .42	59.5 0.3	48.58 .38	22.3 1.6	12.36 .30	18.8 0.4	6.61 .30	50.7 0.5
26.7	6.03 .30	41.2 0.4	26.45 .41	59.8 0.6	48.96 .36	23.9 2.2	12.66 .29	18.4 0.5	6.91 .28	50.2 0.7
Nov. 5.6	6.33 .28	40.8 0.3	26.86 .38	60.4 0.7	49.32 .32	26.1 2.7	12.95 .28	17.9 0.5	7.19 .28	49.5 0.7
15.6	6.61 .25	40.5 0.4	27.24 .34	61.1 1.0	49.64 .28	28.8 3.0	13.23 .26	17.4 0.5	7.47 .26	48.8 0.8
25.6	6.86 .23	40.1 0.3	27.58 .31	62.1 1.2	49.92 .22	31.8 3.4	13.49 .22	16.9 0.5	7.73 .23	48.0 0.7
Dec. 5.6	7.09 .19	39.8 0.2	27.89 .25	63.3 1.3	50.14 .16	35.2 3.6	13.71 .19	16.4 0.4	7.96 .19	47.3 0.7
15.5	7.28 .14	39.6 0.2	28.14 .19	64.6 1.5	50.30 .09	38.8 3.6	13.90 .16	16.0 0.3	8.15 .16	46.6 0.5
25.5	7.42 .10	39.4 0.1	28.33 .13	66.1 1.6	50.39 .02	42.4 3.5	14.06 .10	15.7 0.2	8.31 .11	46.1 0.5
35.5	7.52	39.3	28.46	67.7	50.41	45.9	14.16	15.5	8.42	45.6

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Geminorum. Right Ascension.	ε Geminorum. Declination North.	ψ² Aurigæ. Right Ascension.	ψ² Aurigæ. Declination North.	α Canis Majoris. (Sirius.) Right Ascension.	α Canis Majoris. (Sirius.) Declination South.	θ Geminorum. Right Ascension.	θ Geminorum. Declination North.	ζ Mensæ. Right Ascension.	ζ Mensæ. Declination South.
	h m 6 37	° ′ +25 13	h m 6 39	° ′ +43 40	h m 6 40	° ′ −16 34	h m 6 46	° ′ +34 4	h m 6 48	° ′ −80 42
	s	″	s	″	s	″	s	″	s	″
Jan. 0.5	56.53 .09	32.8 0.1	43.48 .11	21.3 1.2	51.82 .07	61.9 2.4	22.37 .11	36.8 0.6	20.45 0.27	45.0 3.6
10.5	56.62 .04	32.9 0.1	43.59 .04	22.5 1.3	51.89 .01	64.3 2.2	22.48 .05	37.4 0.7	20.18 0.52	48.6 3.4
20.5	56.66 .01	33.0 0.3	43.63 .02	23.8 1.3	51.90 .04	66.5 2.0	22.53 .01	38.1 0.8	19.66 0.76	52.0 3.2
30.4	56.65 .07	33.3 0.3	43.61 .08	25.1 1.2	51.86 .08	68.5 1.8	22.52 .06	38.9 0.8	18.90 0.97	55.2 2.9
Feb. 9.4	56.58 .11	33.6 0.3	43.53 .15	26.3 1.1	51.78 .12	70.3 1.4	22.46 .11	39.7 0.7	17.93 1.16	58.1 2.5
19.4	56.47 .15	33.9 0.3	43.38 .19	27.4 0.9	51.66 .16	71.7 1.1	22.35 .16	40.4 0.6	16.77 1.30	60.6 2.1
Mar. 1.3	56.32 .17	34.2 0.3	43.19 .22	28.3 0.7	51.50 .18	72.8 0.8	22.19 .19	41.0 0.5	15.47 1.41	62.7 1.6
11.3	56.15 .19	34.5 0.1	42.97 .25	29.0 0.5	51.32 .19	73.6 0.5	22.00 .21	41.5 0.4	14.06 1.48	64.3 1.1
21.3	55.96 .20	34.6 0.1	42.72 .25	29.5 0.1	51.13 .20	74.1 0.1	21.79 .22	41.9 0.2	12.58 1.51	65.4 0.5
31.3	55.76 .20	34.7 0.1	42.47 .25	29.6 0.1	50.93 .20	74.2 0.1	21.57 .21	42.1 0.0	11.07 1.51	65.9 0.0
Apr. 10.2	55.56 .17	34.8 0.1	42.22 .22	29.5 0.3	50.73 .18	74.1 0.5	21.36 .20	42.1 0.2	9.56 1.46	65.9 0.4
20.2	55.39 .15	34.7 0.1	42.00 .20	29.2 0.7	50.55 .16	73.6 0.8	21.16 .17	41.9 0.3	8.10 1.39	65.5 1.0
30.2	55.24 .12	34.6 0.2	41.80 .16	28.5 1.0	50.39 .13	72.8 1.1	20.99 .14	41.6 0.5	6.71 1.28	64.5 1.4
May 10.1	55.12 .08	34.4 0.3	41.64 .11	27.7 1.0	50.26 .10	71.7 1.3	20.85 .09	41.1 0.6	5.43 1.15	63.1 1.9
20.1	55.04 .04	34.1 0.3	41.53 .05	26.7 1.1	50.16 .06	70.4 1.6	20.76 .05	40.5 0.7	4.28 0.98	61.2 2.3
30.1	55.00 .01	33.8 0.2	41.48 .01	25.6 1.2	50.10 .02	68.8 1.7	20.71 .01	39.8 0.7	3.30 0.80	58.9 2.6
June 9.1	55.01 .05	33.6 0.3	41.47 .05	24.4 1.3	50.08 .01	67.1 1.9	20.70 .05	39.1 0.7	2.50 0.59	56.3 2.9
19.0	55.06 .09	33.3 0.2	41.52 .11	23.1 1.3	50.09 .06	65.2 2.0	20.75 .09	38.4 0.8	1.91 0.37	53.4 3.1
29.0	55.15 .13	33.1 0.2	41.63 .15	21.8 1.3	50.15 .09	63.2 2.0	20.84 .13	37.6 0.8	1.54 0.14	50.3 3.2
July 9.0	55.28 .17	32.9 0.2	41.78 .19	20.5 1.2	50.24 .13	61.2 2.0	20.97 .17	36.8 0.7	1.40 0.09	47.1 3.2
19.0	55.45 .20	32.7 0.2	41.97 .24	19.3 1.2	50.37 .16	59.2 2.0	21.14 .20	36.1 0.7	1.49 0.32	43.9 3.1
28.9	55.65 .22	32.5 0.1	42.21 .27	18.1 1.1	50.53 .19	57.2 1.8	21.34 .24	35.4 0.7	1.81 0.55	40.8 3.0
Aug. 7.9	55.87 .25	32.4 0.2	42.48 .31	17.0 1.0	50.72 .21	55.4 1.5	21.58 .26	34.7 0.6	2.36 0.76	37.8 2.6
17.9	56.12 .27	32.2 0.2	42.79 .33	16.0 0.9	50.93 .24	53.9 1.3	21.84 .29	34.1 0.6	3.12 0.94	35.2 2.3
27.9	56.39 .29	32.0 0.3	43.12 .35	15.1 0.7	51.17 .25	52.6 0.9	22.13 .31	33.5 0.6	4.06 1.11	32.9 1.9
Sept. 6.8	56.68 .30	31.7 0.3	43.47 .37	14.4 0.7	51.42 .26	51.7 0.5	22.44 .32	32.9 0.5	5.17 1.24	31.0 1.3
16.8	56.98 .31	31.4 0.3	43.84 .39	13.7 0.5	51.68 .28	51.2 0.2	22.76 .34	32.4 0.5	6.41 1.32	29.7 0.7
26.8	57.29 .31	31.1 0.4	44.23 .39	13.2 0.4	51.96 .29	51.0 0.4	23.10 .34	31.9 0.5	7.73 1.36	29.0 0.0
Oct. 6.7	57.60 .32	30.7 0.4	44.62 .39	12.8 0.2	52.25 .28	51.4 0.8	23.44 .35	31.4 0.4	9.09 1.37	29.0 0.0
16.7	57.92 .32	30.3 0.4	45.01 .39	12.6 0.1	52.53 .29	52.2 1.2	23.79 .34	31.0 0.3	10.46 1.31	29.5 0.5
26.7	58.24 .31	29.9 0.4	45.40 .38	12.5 0.1	52.82 .28	53.4 1.6	24.13 .34	30.7 0.3	11.77 1.22	30.7 1.8
Nov. 5.7	58.55 .30	29.5 0.4	45.78 .37	12.6 0.3	53.10 .26	55.0 1.9	24.47 .33	30.4 0.1	12.99 1.07	32.5 2.4
15.6	58.85 .27	29.1 0.4	46.15 .34	12.9 0.5	53.36 .24	56.9 2.2	24.80 .31	30.3 0.0	14.06 0.88	34.9 2.8
25.6	59.12 .25	28.7 0.3	46.49 .30	13.4 0.7	53.60 .21	59.1 2.4	25.11 .28	30.3 0.2	14.94 0.67	37.7 3.2
Dec. 5.6	59.37 .21	28.4 0.2	46.79 .26	14.1 0.9	53.81 .18	61.5 2.5	25.39 .24	30.5 0.3	15.61 0.42	40.9 3.5
15.6	59.58 .18	28.2 0.0	47.05 .21	15.0 1.0	53.99 .14	64.0 2.5	25.63 .19	30.8 0.4	16.03 0.16	44.4 3.6
25.5	59.76 .12	28.2 0.0	47.26 .14	16.0 1.2	54.13 .09	66.5 2.4	25.82 .14	31.2 0.6	16.19 0.10	48.0 3.6
35.5	59.88	28.2	47.40	17.2	54.22	68.9	25.96	31.8	16.09	51.6

FIXED STARS, 1902.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Canis Majoris. Right Ascension.	ε Canis Majoris. Declination South.	ζ Geminorum. Right Ascension.	ζ Geminorum. Declination North.	δ Canis Majoris. Right Ascension.	δ Canis Majoris. Declination South.	63 Aurigæ. Right Ascension.	63 Aurigæ. Declination North.	γ² Volantis. Right Ascension.	γ² Volantis. Declination South.
	h m 6 54	° ' −28 50	h m 6 58	° ' +20 42	h m 7 04	° ' −26 14	h m 7 04	° ' +39 28	h m 7 09	° ' −70 20
Jan. 0.5	48.62	27.5	20.07	40.9	26.51	23.4	57.59	39.2	39.08	29.3
10.5	48.69	30.4	20.18	40.6	26.59	26.2	57.73	40.1	39.07	33.1
20.5	48.71	33.2	20.24	40.5	26.62	28.9	57.80	41.1	38.94	36.8
30.4	48.67	35.7	20.25	40.5	26.59	31.4	57.81	42.2	38.68	40.2
Feb. 9.4	48.58	38.0	20.20	40.6	26.51	33.6	57.76	43.3	38.32	43.4
19.4	48.44	39.9	20.11	40.8	26.39	35.5	57.66	44.3	37.85	46.2
Mar. 1.4	48.27	41.4	19.98	41.0	26.24	37.1	57.50	45.3	37.30	48.6
11.3	48.07	42.6	19.82	41.2	26.05	38.2	57.31	46.0	36.69	50.5
21.3	47.85	43.3	19.64	41.4	25.84	39.0	57.09	46.6	36.03	51.8
31.3	47.63	43.6	19.45	41.5	25.63	39.3	56.85	47.0	35.34	52.7
Apr. 10.2	47.40	43.5	19.26	41.7	25.41	39.3	56.62	47.1	34.65	53.0
20.2	47.19	43.0	19.09	41.8	25.21	38.9	56.40	47.0	33.98	52.8
30.2	47.00	42.1	18.93	41.8	25.02	38.1	56.21	46.7	33.34	52.0
May 10.2	46.84	40.8	18.81	41.8	24.86	36.9	56.05	46.2	32.74	50.7
20.1	46.71	39.2	18.72	41.8	24.73	35.4	55.93	45.5	32.21	49.0
30.1	46.62	37.3	18.67	41.8	24.64	33.7	55.86	44.6	31.75	46.9
June 9.1	46.57	35.2	18.65	41.8	24.58	31.7	55.83	43.6	31.38	44.4
19.1	46.56	32.9	18.68	41.8	24.57	29.5	55.85	42.6	31.11	41.5
29.0	46.59	30.4	18.75	41.7	24.59	27.2	55.92	41.5	30.94	38.4
July 9.0	46.66	27.9	18.86	41.7	24.66	24.8	56.03	40.4	30.87	35.2
19.0	46.77	25.3	19.00	41.7	24.76	22.3	56.19	39.3	30.91	32.0
29.0	46.91	22.9	19.17	41.7	24.90	20.0	56.39	38.2	31.06	28.7
Aug. 7.9	47.09	20.6	19.37	41.7	25.07	17.8	56.62	37.1	31.32	25.6
17.9	47.30	18.6	19.60	41.6	25.26	15.8	56.89	36.1	31.67	22.8
27.9	47.54	16.9	19.85	41.4	25.49	14.2	57.18	35.1	32.12	20.3
Sept. 6.8	47.79	15.5	20.11	41.2	25.74	12.9	57.49	34.2	32.65	18.2
16.8	48.07	14.7	20.39	40.9	26.01	12.0	57.83	33.4	33.24	16.7
26.8	48.37	14.3	20.69	40.5	26.29	11.6	58.18	32.6	33.89	15.8
Oct. 6.8	48.67	14.5	20.99	40.0	26.59	11.8	58.54	32.0	34.57	15.5
16.7	48.98	15.2	21.30	39.4	26.89	12.4	58.91	31.4	35.26	15.8
26.7	49.28	16.4	21.61	38.7	27.20	13.6	59.29	31.0	35.94	16.8
Nov. 5.7	49.58	18.1	21.92	38.0	27.50	15.2	59.66	30.7	36.59	18.5
15.7	49.87	20.2	22.22	37.3	27.78	17.3	60.02	30.6	37.19	20.8
25.6	50.13	22.7	22.50	36.6	28.05	19.7	60.36	30.7	37.71	23.5
Dec. 5.6	50.36	25.5	22.76	36.0	28.28	22.3	60.67	30.9	38.14	26.7
15.6	50.55	28.5	22.98	35.4	28.48	25.2	60.94	31.4	38.46	30.2
25.5	50.69	31.5	23.17	35.0	28.64	28.1	61.17	32.1	38.66	33.9
35.5	50.79	34.5	23.31	34.7	28.75	31.0	61.34	32.9	38.73	37.6

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	25 Camelop. (H.) R.A.	25 Camelop. Decl. North	δ Geminorum R.A.	δ Geminorum Decl. North	Piazzi vii, 67 R.A.	Piazzi vii, 67 Decl. North	β Canis Minoris R.A.	β Canis Minoris Decl. North	α² Geminorum (Castor.) R.A.	α² Geminorum Decl. North
	h m / 7 10	° ' / +82 35	h m / 7 14	° ' / +22 09	h m / 7 20	° ' / +68 39	h m / 7 21	° ' / +8 28	h m / 7 28	° ' / +32 05
	s	"	s	"	s	"	s	"	s	"
Jan. 0.5	41.77 (0.47)	52.0 (3.0)	18.51 (.13)	35.7 (0.2)	46.02 (.25)	45.4 (2.4)	52.30 (.13)	62.5 (1.1)	23.25 (.15)	61.6 (0.3)
10.5	42.24 (0.13)	55.0 (3.1)	18.64 (.08)	35.5 (0.1)	46.27 (.13)	47.8 (2.5)	52.43 (.07)	61.4 (0.9)	23.40 (.10)	61.9 (0.6)
20.5	42.37 (0.22)	58.1 (2.9)	18.72 (.02)	35.4 (0.1)	46.40 (.01)	50.3 (2.5)	52.50 (.03)	60.5 (0.7)	23.50 (.04)	62.5 (0.6)
30.5	42.15 (0.55)	61.0 (2.8)	18.74 (.03)	35.5 (0.1)	46.39 (.13)	52.8 (2.5)	52.53 (.03)	59.8 (0.6)	23.54 (.02)	63.1 (0.8)
Feb. 9.4	41.60 (0.87)	63.8 (2.6)	18.71 (.08)	35.6 (0.3)	46.26 (.24)	55.3 (2.2)	52.50 (.07)	59.2 (0.4)	23.52 (.08)	63.9 (0.7)
19.4	40.73 (1.13)	66.4 (2.1)	18.63 (.12)	35.9 (0.3)	46.02 (.35)	57.5 (2.0)	52.43 (.11)	58.8 (0.3)	23.44 (.12)	64.6 (0.8)
Mar. 1.4	39.60 (1.34)	68.5 (1.7)	18.51 (.16)	36.2 (0.3)	45.67 (.43)	59.5 (1.6)	52.32 (.14)	58.5 (0.2)	23.32 (.16)	65.4 (0.7)
11.3	38.26 (1.49)	70.2 (1.2)	18.35 (.17)	36.5 (0.3)	45.24 (.49)	61.1 (1.2)	52.18 (.16)	58.3 (0.0)	23.16 (.19)	66.1 (0.6)
21.3	36.77 (1.58)	71.4 (0.6)	18.18 (.19)	36.8 (0.2)	44.75 (.52)	62.3 (0.7)	52.02 (.18)	58.3 (0.1)	22.97 (.20)	66.7 (0.4)
31.3	35.19 (1.60)	72.0 (0.0)	17.99 (.19)	37.0 (0.2)	44.23 (.53)	63.0 (0.2)	51.84 (.18)	58.4 (0.1)	22.77 (.21)	67.1 (0.3)
Apr. 10.3	33.59 (1.55)	72.0 (0.5)	17.80 (.18)	37.2 (0.2)	43.70 (.52)	63.2 (0.3)	51.66 (.17)	58.5 (0.3)	22.56 (.20)	67.4 (0.2)
20.2	32.04 (1.45)	71.5 (1.1)	17.62 (.16)	37.4 (0.0)	43.18 (.49)	62.9 (0.7)	51.49 (.15)	58.8 (0.3)	22.36 (.18)	67.6 (0.0)
30.2	30.59 (1.28)	70.4 (1.6)	17.46 (.13)	37.4 (0.1)	42.69 (.42)	62.2 (1.2)	51.34 (.13)	59.1 (0.4)	22.18 (.16)	67.6 (0.2)
May 10.2	29.31 (1.08)	68.8 (2.1)	17.33 (.11)	37.5 (0.1)	42.27 (.35)	61.0 (1.5)	51.21 (.10)	59.5 (0.4)	22.02 (.12)	67.4 (0.3)
20.2	28.23 (0.84)	66.7 (2.4)	17.22 (.06)	37.4 (0.0)	41.92 (.27)	59.5 (1.9)	51.11 (.07)	59.9 (0.5)	21.90 (.08)	67.1 (0.5)
30.1	27.39 (0.57)	64.3 (2.7)	17.16 (.02)	37.4 (0.1)	41.65 (.17)	57.6 (2.2)	51.04 (.03)	60.4 (0.6)	21.82 (.05)	66.6 (0.6)
June 9.1	26.82 (0.30)	61.6 (2.9)	17.14 (.01)	37.3 (0.1)	41.48 (.07)	55.4 (2.4)	51.01 (.01)	61.0 (0.6)	21.77 (.00)	66.0 (0.6)
19.1	26.52 (0.00)	58.7 (3.0)	17.15 (.05)	37.2 (0.1)	41.41 (.03)	53.0 (2.5)	51.02 (.04)	61.6 (0.7)	21.77 (.04)	65.4 (0.7)
29.0	26.52 (0.27)	55.7 (3.1)	17.20 (.09)	37.1 (0.2)	41.44 (.13)	50.5 (2.6)	51.06 (.07)	62.3 (0.6)	21.81 (.09)	64.7 (0.7)
July 9.0	26.79 (0.56)	52.6 (3.0)	17.29 (.13)	36.9 (0.1)	41.57 (.22)	47.9 (2.6)	51.13 (.11)	62.9 (0.7)	21.90 (.12)	64.0 (0.8)
19.0	27.35 (0.82)	49.6 (3.0)	17.42 (.16)	36.8 (0.2)	41.79 (.31)	45.3 (2.6)	51.24 (.14)	63.6 (0.6)	22.02 (.15)	63.2 (0.8)
29.0	28.17 (1.06)	46.6 (2.8)	17.58 (.19)	36.6 (0.2)	42.10 (.40)	42.7 (2.5)	51.38 (.16)	64.2 (0.5)	22.17 (.19)	62.4 (0.8)
Aug. 7.9	29.23 (1.29)	43.8 (2.6)	17.77 (.21)	36.4 (0.2)	42.50 (.47)	40.2 (2.3)	51.54 (.20)	64.7 (0.4)	22.36 (.22)	61.6 (0.8)
17.9	30.52 (1.48)	41.2 (2.3)	17.98 (.24)	36.2 (0.3)	42.97 (.54)	37.9 (2.1)	51.74 (.21)	65.1 (0.3)	22.58 (.25)	60.8 (0.8)
27.9	32.00 (1.65)	38.9 (2.0)	18.22 (.26)	35.9 (0.4)	43.51 (.60)	35.8 (1.9)	51.95 (.23)	65.4 (0.1)	22.83 (.27)	60.0 (0.9)
Sept. 6.9	33.65 (1.80)	36.9 (1.6)	18.48 (.28)	35.5 (0.4)	44.11 (.65)	33.9 (1.6)	52.18 (.26)	65.5 (0.1)	23.10 (.30)	59.1 (0.8)
16.8	35.45 (1.90)	35.3 (1.3)	18.76 (.29)	35.1 (0.6)	44.76 (.69)	32.3 (1.4)	52.44 (.27)	65.4 (0.3)	23.40 (.31)	58.3 (0.9)
26.8	37.35 (1.97)	34.0 (0.8)	19.05 (.30)	34.5 (0.6)	45.45 (.73)	30.9 (1.0)	52.71 (.28)	65.1 (0.5)	23.71 (.32)	57.4 (0.8)
Oct. 6.8	39.32 (2.01)	33.2 (0.4)	19.35 (.31)	33.9 (0.7)	46.18 (.74)	29.9 (0.6)	52.99 (.29)	64.6 (0.8)	24.03 (.34)	56.6 (0.9)
16.7	41.33 (2.00)	32.8 (0.1)	19.66 (.32)	33.2 (0.8)	46.92 (.74)	29.3 (0.2)	53.28 (.30)	63.8 (0.9)	24.37 (.35)	55.7 (0.7)
26.7	43.33 (1.95)	32.9 (0.6)	19.98 (.32)	32.4 (0.8)	47.66 (.74)	29.1 (0.2)	53.58 (.29)	62.9 (1.1)	24.72 (.34)	55.0 (0.7)
Nov. 5.7	45.28 (1.86)	33.5 (1.1)	20.30 (.31)	31.6 (0.7)	48.40 (.71)	29.3 (0.6)	53.87 (.29)	61.8 (1.2)	25.06 (.34)	54.3 (0.6)
15.7	47.14 (1.71)	34.6 (1.5)	20.61 (.29)	30.9 (0.8)	49.11 (.67)	29.9 (1.0)	54.16 (.28)	60.6 (1.3)	25.40 (.33)	53.7 (0.4)
25.6	48.85 (1.51)	36.1 (2.0)	20.90 (.27)	30.1 (0.6)	49.78 (.61)	30.9 (1.4)	54.44 (.26)	59.3 (1.3)	25.73 (.31)	53.3 (0.3)
Dec. 5.6	50.36 (1.28)	38.1 (2.4)	21.17 (.25)	29.5 (0.6)	50.39 (.54)	32.3 (1.7)	54.70 (.23)	58.0 (1.3)	26.04 (.27)	53.0 (0.1)
15.6	51.64 (1.00)	40.5 (2.7)	21.42 (.20)	28.9 (0.4)	50.93 (.43)	34.0 (2.1)	54.93 (.19)	56.7 (1.3)	26.31 (.23)	52.9 (0.1)
25.6	52.64 (0.68)	43.2 (2.9)	21.62 (.16)	28.5 (0.2)	51.36 (.33)	36.1 (2.4)	55.12 (.16)	55.4 (1.2)	26.54 (.19)	53.0 (0.3)
35.5	53.32	46.1	21.78	28.3	51.69	38.5	55.28	54.2	26.73	53.3

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Canis Minoris. (*Procyon.*) Right Ascension.	Declination North.	β Geminorum. (*Pollux.*) Right Ascension.	Declination North.	φ Geminorum. Right Ascension.	Declination North.	26 Lyncis. Right Ascension.	Declination North.	Groombridge 1374. Right Ascension.	Declination North.
	h m 7 34	° ' + 5 28	h m 7 39	° ' +28 15	h m 7 47	° ' +27 00	h m 7 47	° ' +47 48	h m 7 48	° ' +74 10
	s	"	s	"	s	"	s	"	s	"
Jan. 0.6	12.43 .13	22.9 1.3	21.47 .16	34.6 0.1	32.28 .17	58.1 0.0	37.50 .21	53.7 1.2	34.12 .40	32.9 2.5
10.5	12.56 .09	21.6 1.2	21.63 .11	34.7 0.3	32.45 .11	58.1 0.1	37.71 .13	54.9 1.5	34.52 .23	35.4 2.7
20.5	12.65 .03	20.4 1.0	21.74 .05	35.0 0.4	32.56 .06	58.2 0.4	37.84 .07	56.4 1.5	34.75 .07	38.1 2.8
30.5	12.68 .02	19.4 0.8	21.79 .01	35.4 0.5	32.62 .00	58.6 0.4	37.91 .01	57.9 1.6	34.82 .11	40.9 2.7
Feb. 9.4	12.66 .06	18.6 0.6	21.78 .06	35.9 0.6	32.62 .05	59.0 0.6	37.90 .08	59.5 1.6	34.71 .26	43.6 2.6
19.4	12.60 .10	18.0 0.4	21.72 .11	36.5 0.7	32.57 .10	59.6 0.6	37.82 .14	61.1 1.5	34.45 .41	46.2 2.3
Mar. 1.4	12.50 .14	17.6 0.3	21.61 .15	37.2 0.6	32.47 .14	60.2 0.6	37.68 .19	62.6 1.4	34.04 .53	48.5 2.0
11.4	12.36 .16	17.3 0.2	21.46 .17	37.8 0.5	32.33 .17	60.8 0.6	37.49 .23	64.0 1.1	33.51 .62	50.5 1.6
21.3	12.20 .17	17.1 0.0	21.29 .19	38.3 0.5	32.16 .18	61.4 0.5	37.26 .26	65.1 0.8	32.89 .69	52.1 1.0
31.3	12.03 .18	17.1 0.2	21.10 .20	38.8 0.4	31.98 .19	61.9 0.4	37.00 .26	65.9 0.6	32.20 .71	53.1 0.6
Apr. 10.3	11.85 .17	17.3 0.2	20.90 .19	39.2 0.2	31.79 .19	62.3 0.2	36.74 .26	66.5 0.2	31.49 .72	53.7 0.1
20.3	11.68 .16	17.5 0.3	20.71 .18	39.4 0.1	31.60 .18	62.5 0.2	36.48 .25	66.7 0.1	30.77 .69	53.8 0.5
30.2	11.52 .13	17.8 0.5	20.53 .16	39.5 0.1	31.42 .15	62.7 0.0	36.23 .22	66.6 0.5	30.08 .63	53.3 1.0
May 10.2	11.39 .11	18.3 0.5	20.37 .12	39.4 0.1	31.27 .13	62.7 0.1	36.01 .18	66.1 0.7	29.45 .55	52.3 1.5
20.2	11.28 .07	18.8 0.6	20.25 .09	39.3 0.3	31.14 .09	62.6 0.1	35.83 .14	65.4 0.9	28.90 .45	50.8 1.8
30.1	11.21 .05	19.4 0.6	20.16 .05	39.0 0.3	31.05 .05	62.5 0.3	35.69 .09	64.5 1.2	28.45 .34	49.0 2.2
June 9.1	11.16 .01	20.0 0.7	20.11 .01	38.7 0.4	31.00 .02	62.2 0.3	35.60 .04	63.3 1.4	28.11 .21	46.8 2.5
19.1	11.15 .03	20.7 0.8	20.10 .03	38.3 0.5	30.98 .03	61.9 0.4	35.56 .02	61.9 1.5	27.90 .08	44.3 2.7
29.0	11.18 .06	21.5 0.7	20.13 .07	37.8 0.5	31.01 .06	61.5 0.5	35.58 .06	60.4 1.6	27.82 .04	41.6 2.8
July 9.0	11.24 .10	22.2 0.8	20.20 .10	37.3 0.6	31.07 .09	61.0 0.5	35.64 .11	58.8 1.7	27.86 .17	38.8 2.9
19.0	11.34 .12	23.0 0.7	20.30 .14	36.7 0.6	31.16 .13	60.5 0.6	35.75 .17	57.1 1.8	28.03 .30	35.9 2.9
29.0	11.46 .15	23.7 0.6	20.44 .17	36.1 0.7	31.29 .16	59.9 0.6	35.92 .20	55.3 1.7	28.33 .42	33.0 2.8
Aug. 8.0	11.61 .18	24.3 0.5	20.61 .20	35.4 0.7	31.45 .20	59.3 0.7	36.12 .24	53.6 1.7	28.75 .52	30.2 2.7
17.9	11.79 .20	24.8 0.4	20.81 .23	34.7 0.7	31.65 .22	58.6 0.7	36.36 .29	51.9 1.6	29.27 .62	27.5 2.6
27.9	11.99 .22	25.2 0.1	21.04 .25	34.0 0.8	31.87 .24	57.9 0.8	36.65 .31	50.3 1.6	29.89 .71	24.9 2.3
Sept. 6.9	12.21 .25	25.3 0.0	21.29 .28	33.2 0.8	32.11 .27	57.1 0.8	36.96 .35	48.7 1.5	30.60 .80	22.6 2.1
16.8	12.46 .25	25.3 0.3	21.57 .29	32.4 0.8	32.38 .28	56.3 0.9	37.31 .37	47.2 1.4	31.40 .86	20.5 1.7
26.8	12.71 .28	25.0 0.5	21.86 .31	31.6 0.9	32.66 .31	55.4 0.9	37.68 .39	45.8 1.2	32.26 .91	18.8 1.4
Oct. 6.8	12.99 .29	24.5 0.8	22.17 .32	30.7 0.9	32.97 .32	54.5 1.0	38.07 .42	44.6 1.1	33.17 .95	17.4 1.1
16.8	13.28 .29	23.7 1.1	22.49 .31	29.8 0.9	33.29 .32	53.5 0.9	38.49 .42	43.5 0.8	34.12 .98	16.3 0.6
26.7	13.57 .29	22.6 1.2	22.83 .33	28.9 0.9	33.61 .34	52.6 1.0	38.91 .43	42.7 0.6	35.10 .97	15.7 0.1
Nov. 5.7	13.86 .30	21.4 1.3	23.16 .33	28.0 0.8	33.95 .33	51.6 1.0	39.34 .43	42.1 0.6	36.07 .95	15.6 0.1
15.7	14.16 .28	20.1 1.5	23.49 .33	27.2 0.6	34.28 .33	50.8 0.8	39.77 .41	41.8 0.3	37.02 .91	15.9 0.3
25.7	14.44 .26	18.6 1.6	23.82 .30	26.6 0.6	34.61 .30	50.0 0.8	40.18 .39	41.7 0.1	37.93 .84	16.7 0.8
Dec. 5.6	14.70 .23	17.0 1.5	24.12 .27	26.0 0.6	34.91 .28	49.3 0.7	40.57 .35	42.0 0.3	38.77 .75	17.9 1.2
15.6	14.93 .20	15.5 1.5	24.39 .24	25.7 0.3	35.19 .24	48.8 0.5	40.92 .31	42.6 0.3	39.52 .63	19.6 1.7
25.6	15.13 .16	14.0 1.5	24.63 .19	25.5 0.2	35.43 .20	48.5 0.3	41.23 .21	43.4 0.8	40.15 .50	21.7 2.1
35.5	15.29	12.6 1.4	24.82	25.5 0.0	35.63	48.4 0.1	41.47	44.5 1.1	40.65	24.1 2.4

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ω¹ Cancri.		3 Ursæ Majoris (H.)		15 Argûs (ρ).		ζ¹ Cancri.		β Cancri.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 7 55	° ′ +25 39	h m 8 03	° ′ +68 45	h m 8 03	° ′ −24 1	h m 8 06	° ′ +17 56	h m 8 11	° ′ + 9 28
	s	″	s	″	s	″	s	″	s	″
Jan. 0.6	2.32 .17	27.5 0.1	8.21 .36	30.0 2.2	24.32 .14	24.6 2.9	37.61 .18	24.3 0.7	14.06 .17	64.4 1.1
10.5	2.49 .12	27.4 0.1	8.57 .23	32.2 2.5	24.46 .10	27.5 2.8	37.79 .12	23.6 0.4	14.23 .13	63.3 1.0
20.5	2.61 .07	27.5 0.2	8.80 .11	34.7 2.5	24.56 .04	30.3 2.6	37.91 .08	23.2 0.3	14.36 .07	62.3 0.8
30.5	2.68 .01	27.7 0.4	8.91 .03	37.2 2.6	24.60 .01	32.9 2.4	37.99 .02	22.9 0.1	14.43 .02	61.5 0.6
Feb. 9.5	2.69 .05	28.1 0.5	8.88 .15	39.8 2.5	24.59 .06	35.3 2.1	38.01 .03	22.8 0.1	14.45 .03	60.9 0.4
19.4	2.64 .09	28.6 0.6	8.73 .26	42.3 2.3	24.53 .11	37.4 1.8	37.98 .08	22.9 0.2	14.42 .07	60.5 0.3
Mar. 1.4	2.55 .13	29.2 0.6	8.47 .36	44.6 2.0	24.42 .14	39.2 1.5	37.90 .11	23.1 0.3	14.35 .11	60.2 0.1
11.4	2.42 .16	29.8 0.5	8.11 .44	46.6 1.7	24.28 .17	40.7 1.1	37.79 .15	23.4 0.3	14.24 .14	60.1 0.1
21.3	2.26 .18	30.3 0.5	7.67 .49	48.3 1.2	24.11 .19	41.8 0.7	37.64 .17	23.7 0.4	14.10 .16	60.2 0.1
31.3	2.08 .19	30.8 0.4	7.18 .52	49.5 0.8	23.92 .20	42.5 0.4	37.47 .17	24.1 0.4	13.94 .16	60.3 0.3
Apr. 10.3	1.89 .18	31.2 0.4	6.66 .53	50.3 0.3	23.72 .19	42.9 0.0	37.30 .17	24.5 0.3	13.78 .17	60.6 0.3
20.3	1.71 .18	31.6 0.2	6.13 .51	50.6 0.2	23.53 .19	42.9 0.3	37.13 .17	24.8 0.3	13.61 .16	60.9 0.3
30.2	1.53 .15	31.8 0.1	5.62 .47	50.4 0.7	23.34 .17	42.6 0.7	36.96 .15	25.1 0.3	13.45 .14	61.2 0.4
May 10.2	1.38 .13	31.9 0.0	5.15 .41	49.7 1.2	23.17 .15	41.9 1.0	36.81 .12	25.4 0.2	13.31 .12	61.6 0.5
20.2	1.25 .09	31.9 0.1	4.74 .35	48.5 1.5	23.02 .12	40.9 1.3	36.69 .10	25.6 0.2	13.19 .10	62.1 0.4
30.2	1.16 .06	31.8 0.2	4.39 .26	47.0 1.9	22.90 .09	39.6 1.6	36.59 .06	25.8 0.2	13.09 .06	62.5 0.5
June 9.1	1.10 .02	31.6 0.3	4.13 .17	45.1 2.2	22.81 .06	38.0 1.8	36.53 .03	26.0 0.1	13.03 .03	63.0 0.5
19.1	1.08 .01	31.3 0.3	3.96 .08	42.9 2.4	22.75 .03	36.2 2.0	36.50 .01	26.1 0.1	13.00 .00	63.5 0.5
29.1	1.09 .05	31.0 0.4	3.88 .02	40.5 2.6	22.72 .01	34.2 2.1	36.51 .04	26.2 0.0	13.00 .03	64.0 0.6
July 9.0	1.14 .09	30.6 0.5	3.90 .11	37.9 2.7	22.73 .05	32.1 2.2	36.55 .07	26.2 0.0	13.03 .06	64.6 0.4
19.0	1.23 .12	30.1 0.5	4.01 .20	35.2 2.8	22.78 .08	29.9 2.2	36.62 .10	26.2 0.1	13.09 .09	65.0 0.4
29.0	1.35 .15	29.6 0.5	4.21 .29	32.4 2.7	22.86 .11	27.7 2.1	36.72 .13	26.1 0.1	13.18 .12	65.4 0.3
Aug. 8.0	1.50 .19	29.1 0.6	4.50 .37	29.7 2.7	22.97 .14	25.6 1.9	36.85 .17	25.9 0.2	13.30 .15	65.7 0.3
17.9	1.69 .21	28.5 0.7	4.87 .45	27.0 2.5	23.11 .18	23.7 1.7	37.02 .19	25.7 0.4	13.45 .18	66.0 0.0
27.9	1.90 .23	27.8 0.8	5.32 .52	24.5 2.4	23.29 .20	22.0 1.4	37.21 .21	25.3 0.4	13.63 .20	66.0 0.0
Sept. 6.9	2.13 .26	27.0 0.8	5.84 .58	22.1 2.2	23.49 .23	20.6 1.0	37.42 .24	24.9 0.6	13.83 .22	66.0 0.3
16.9	2.39 .28	26.2 0.9	6.42 .63	19.9 1.9	23.72 .26	19.6 0.6	37.66 .26	24.3 0.8	14.05 .25	65.7 0.5
26.8	2.67 .30	25.3 1.0	7.05 .68	18.0 1.6	23.98 .28	19.0 0.2	37.92 .27	23.5 0.9	14.30 .26	65.2 0.7
Oct. 6.8	2.97 .31	24.3 1.0	7.73 .72	16.4 1.2	24.26 .29	18.8 0.4	38.19 .30	22.6 1.0	14.56 .29	64.5 0.9
16.8	3.28 .33	23.3 1.0	8.45 .74	15.2 0.9	24.55 .31	19.2 0.9	38.49 .31	21.6 1.1	14.85 .29	63.6 1.1
26.7	3.61 .33	22.3 1.1	9.19 .75	14.3 0.4	24.86 .31	20.1 1.3	38.80 .31	20.5 1.2	15.14 .31	62.5 1.3
Nov. 5.7	3.94 .33	21.2 0.9	9.94 .74	13.9 0.1	25.17 .31	21.4 1.8	39.11 .32	19.3 1.2	15.45 .31	61.2 1.4
15.7	4.27 .33	20.3 0.9	10.68 .72	13.8 0.4	25.48 .30	23.2 2.1	39.43 .31	18.1 1.2	15.76 .30	59.8 1.5
25.7	4.60 .30	19.4 0.8	11.40 .67	14.2 0.9	25.78 .28	25.3 2.5	39.74 .30	16.9 1.2	16.06 .29	58.3 1.5
Dec. 5.6	4.90 .28	18.6 0.6	12.07 .61	15.1 1.3	26.06 .25	27.8 2.7	40.04 .28	15.7 1.0	16.35 .26	56.8 1.4
15.6	5.18 .25	18.0 0.4	12.68 .53	16.4 1.7	26.31 .22	30.5 2.8	40.32 .24	14.7 0.9	16.61 .24	55.4 1.4
25.6	5.43 .21	17.6 0.2	13.21 .42	18.1 2.1	26.53 .17	33.3 2.9	40.56 .20	13.8 0.8	16.85 .20	54.0 1.2
35.6	5.64	17.4	13.63	20.2	26.70	36.2	40.76	13.0	17.05	52.8

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	30 Monocerotis. Right Ascension.	30 Monocerotis. Declination South.	θ Chamæleontis. Right Ascension.	θ Chamæleontis. Declination South.	η Cancri. Right Ascension	η Cancri. Declination North.	σ Hydræ. Right Ascension.	σ Hydræ. Declination North.	) Cancri. Right Ascension.	) Cancri. Declination North.
	h m 8 20	° ′ — 3 35	h m 8 23	° ′ —77 10	h m 8 27	° ′ +20 46	h m 8 33	° ′ + 3 40	h m 8 37	° ′ +21 48
	s	″	s	″	s	″	s	″	s	″
Jan. 0.6	47.82 (.17)	21.2 (1.9)	41.56 (.28)	6.6 (3.8)	4.58 (.20)	13.8 (0.5)	40.07 (.19)	57.7 (1.6)	38.95 (.21)	62.2 (0.6)
10.6	47.99 (.13)	23.1 (1.8)	41.84 (.08)	10.4 (3.8)	4.78 (.15)	13.3 (0.4)	40.26 (.14)	56.1 (1.4)	39.16 (.16)	61.6 (0.3)
20.5	48.12 (.07)	24.9 (1.6)	41.92 (.10)	14.2 (3.8)	4.93 (.09)	12.9 (0.1)	40.40 (.10)	54.7 (1.4)	39.32 (.11)	61.3 (0.1)
30.5	48.19 (.02)	26.5 (1.4)	41.82 (.28)	18.0 (3.8)	5.02 (.04)	12.8 (0.1)	40.50 (.04)	53.5 (1.2)	39.43 (.05)	61.2 (0.2)
Feb. 9.5	48.21 (.02)	27.9 (1.1)	41.54 (.46)	21.7 (3.7)	5.06 (.01)	12.9 (0.1)	40.54 (.01)	52.5 (1.0)	39.48 (.00)	61.4 (0.2)
19.4	48.19 (.07)	29.0 (1.0)	41.08 (.60)	25.2 (3.5)	5.05 (.06)	13.1 (0.2)	40.53 (.06)	51.8 (0.7)	39.48 (.05)	61.7 (0.3)
Mar. 1.4	48.12 (.10)	30.0 (1.0)	40.48 (.73)	28.5 (3.3)	4.99 (.10)	13.5 (0.4)	40.47 (.09)	51.2 (0.6)	39.43 (.09)	62.1 (0.4)
11.4	48.02 (.14)	30.7 (0.7)	39.75 (.84)	31.3 (2.8)	4.89 (.13)	13.9 (0.4)	40.38 (.12)	50.9 (0.3)	39.34 (.13)	62.6 (0.5)
21.4	47.88 (.15)	31.1 (0.4)	38.91 (.92)	33.8 (2.5)	4.76 (.16)	14.4 (0.5)	40.26 (.15)	50.7 (0.2)	39.21 (.16)	63.2 (0.6)
31.3	47.73 (.17)	31.3 (0.2)	37.99 (.98)	35.8 (2.0)	4.60 (.17)	15.0 (0.6)	40.11 (.16)	50.7 (0.0)	39.05 (.16)	63.8 (0.6)
		(0.1)		(1.5)		(0.5)		(0.1)		(0.6)
Apr. 10.3	47.56 (.16)	31.4 (0.2)	37.01 (1.00)	37.3 (0.9)	4.43 (.18)	15.5 (0.4)	39.95 (.16)	50.8 (0.3)	38.89 (.18)	64.4 (0.5)
20.3	47.40 (.16)	31.2 (0.3)	36.01 (1.01)	38.2 (0.5)	4.25 (.17)	15.9 (0.4)	39.79 (.15)	51.1 (0.3)	38.71 (.17)	64.9 (0.4)
30.3	47.24 (.15)	30.9 (0.5)	35.00 (.98)	38.7 (0.1)	4.08 (.15)	16.3 (0.3)	39.64 (.15)	51.4 (0.5)	38.54 (.15)	65.3 (0.4)
May 10.2	47.09 (.12)	30.4 (0.7)	34.02 (.95)	38.6 (0.6)	3.93 (.13)	16.6 (0.2)	39.49 (.13)	51.9 (0.5)	38.39 (.14)	65.7 (0.2)
20.2	46.97 (.11)	29.7 (0.8)	33.07 (.88)	38.0 (1.1)	3.80 (.11)	16.8 (0.2)	39.36 (.10)	52.4 (0.7)	38.25 (.11)	65.9 (0.2)
30.2	46.86 (.07)	28.9 (1.0)	32.19 (.79)	36.9 (1.6)	3.69 (.08)	17.0 (0.1)	39.26 (.08)	53.1 (0.6)	38.14 (.09)	66.1 (0.0)
June 9.2	46.79 (.05)	27.9 (1.0)	31.40 (.69)	35.3 (2.1)	3.61 (.04)	17.1 (0.0)	39.18 (.05)	53.7 (0.8)	38.05 (.05)	66.1 (0.0)
19.1	46.74 (.01)	26.9 (1.1)	30.71 (.56)	33.2 (2.4)	3.57 (.02)	17.1 (0.1)	39.13 (.02)	54.5 (0.7)	38.00 (.02)	66.1 (0.1)
29.1	46.73 (.01)	25.8 (1.2)	30.15 (.43)	30.8 (2.8)	3.55 (.02)	17.0 (0.1)	39.11 (.01)	55.2 (0.8)	37.98 (.01)	66.0 (0.2)
July 9.1	46.74 (.05)	24.6 (1.1)	29.72 (.28)	28.0 (3.0)	3.57 (.06)	16.9 (0.2)	39.12 (.04)	56.0 (0.7)	37.99 (.04)	65.8 (0.3)
19.0	46.79 (.08)	23.5 (1.2)	29.44 (.11)	25.0 (3.1)	3.63 (.08)	16.7 (0.3)	39.16 (.07)	56.7 (0.7)	38.03 (.07)	65.5 (0.3)
29.0	46.87 (.10)	22.3 (1.2)	29.33 (.05)	21.9 (3.2)	3.71 (.12)	16.4 (0.4)	39.23 (.09)	57.4 (0.6)	38.10 (.11)	65.2 (0.5)
Aug. 8.0	46.97 (.13)	21.3 (0.9)	29.38 (.22)	18.7 (3.1)	3.83 (.14)	16.0 (0.5)	39.32 (.13)	58.0 (0.5)	38.21 (.13)	64.7 (0.6)
18.0	47.10 (.16)	20.4 (0.8)	29.60 (.38)	15.6 (3.0)	3.97 (.17)	15.5 (0.6)	39.45 (.15)	58.5 (0.4)	38.34 (.17)	64.1 (0.7)
27.9	47.26 (.19)	19.6 (0.5)	29.98 (.54)	12.6 (2.7)	4.14 (.20)	14.9 (0.7)	39.60 (.18)	58.9 (0.1)	38.51 (.19)	63.4 (0.8)
Sept. 6.9	47.45 (.21)	19.1 (0.2)	30.52 (.69)	9.9 (2.3)	4.34 (.23)	14.2 (0.8)	39.78 (.20)	59.0 (0.1)	38.70 (.21)	62.6 (0.9)
16.9	47.66 (.23)	18.9 (0.0)	31.21 (.81)	7.6 (1.8)	4.57 (.25)	13.4 (0.9)	39.98 (.23)	58.9 (0.3)	38.91 (.25)	61.7 (1.0)
26.8	47.89 (.26)	18.9 (0.4)	32.02 (.91)	5.8 (1.3)	4.82 (.27)	12.5 (1.1)	40.21 (.25)	58.6 (0.6)	39.16 (.27)	60.7 (1.2)
Oct. 6.8	48.15 (.27)	19.3 (0.7)	32.93 (.98)	4.5 (0.7)	5.09 (.29)	11.4 (1.2)	40.46 (.27)	58.0 (0.9)	39.43 (.29)	59.5 (1.2)
16.8	48.42 (.29)	20.0 (1.0)	33.91 (1.03)	3.8 (0.0)	5.38 (.31)	10.2 (1.2)	40.73 (.29)	57.1 (1.1)	39.72 (.30)	58.3 (1.3)
26.8	48.71 (.30)	21.0 (1.3)	34.94 (1.03)	3.8 (0.6)	5.69 (.32)	9.0 (1.3)	41.02 (.30)	56.0 (1.3)	40.02 (.33)	57.0 (1.4)
Nov. 5.7	49.01 (.30)	22.3 (1.6)	35.97 (1.01)	4.4 (1.3)	6.01 (.33)	7.7 (1.3)	41.32 (.31)	54.7 (1.5)	40.35 (.33)	55.6 (1.3)
15.7	49.31 (.30)	23.9 (1.8)	36.98 (.94)	5.7 (1.9)	6.34 (.32)	6.4 (1.3)	41.63 (.30)	53.2 (1.7)	40.68 (.32)	54.3 (1.3)
25.7	49.61 (.29)	25.7 (1.9)	37.92 (.84)	7.6 (2.4)	6.66 (.32)	5.2 (1.2)	41.93 (.30)	51.5 (1.7)	41.00 (.32)	53.0 (1.2)
Dec. 5.7	49.90 (.26)	27.6 (2.0)	38.76 (.71)	10.0 (3.0)	6.98 (.29)	4.0 (1.0)	42.23 (.27)	49.8 (1.8)	41.32 (.31)	51.8 (1.1)
15.6	50.16 (.23)	29.6 (2.0)	39.47 (.56)	13.0 (3.3)	7.27 (.26)	3.0 (0.9)	42.50 (.25)	48.0 (1.8)	41.63 (.27)	50.7 (0.9)
25.6	50.39 (.20)	31.6 (2.0)	40.03 (.38)	16.3 (3.6)	7.53 (.23)	2.1 (0.7)	42.75 (.21)	46.2 (1.6)	41.90 (.23)	49.8 (0.6)
35.6	50.59	33.6	40.41	19.9	7.76	1.4	42.96	44.6	42.13	49.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Hydræ.		σ² Cancri (mean).		ι Ursæ Majoris.		σ² Ursæ Majoris.		κ Cancri.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 8 41	° ′ +6 46	h m 8 48	° ′ +30 56	h m 8 52	° ′ +48 25	h m 9 01	° ′ +67 31	h m 9 02	° ′ +11 03
	s	″	s	″	s	″	s	″	s	″
Jan. 0.6	37.12 .20	31.5 1.4	18.05 .23	47.1 0.1	32.38 .29	17.8 0.9	49.96 .46	37.1 1.7	28.24 .22	33.6 1.3
10.6	37.32 .15	30.1 1.3	18.28 .19	47.0 0.2	32.67 .22	18.7 1.2	50.42 .36	38.8 2.1	28.46 .17	32.3 1.0
20.5	37.47 .10	28.8 1.0	18.47 .12	47.2 0.5	32.89 .16	19.9 1.5	50.78 .25	40.9 2.3	28.63 .13	31.3 0.8
30.5	37.57 .05	27.8 0.8	18.59 .07	47.7 0.7	33.05 .08	21.4 1.6	51.03 .12	43.2 2.6	28.76 .07	30.5 0.6
Feb. 9.5	37.62 .00	27.0 0.6	18.66 .01	48.4 0.8	33.13 .01	23.0 1.8	51.15 .00	45.8 2.6	28.83 .02	29.9 0.4
19.5	37.62 .04	26.4 0.4	18.67 .04	49.2 0.9	33.14 .07	24.8 1.8	51.15 .11	48.4 2.6	28.85 .02	29.5 0.1
Mar. 1.4	37.58 .09	26.0 0.2	18.63 .09	50.1 1.0	33.07 .12	26.6 1.8	51.04 .23	51.0 2.4	28.83 .07	29.4 0.0
11.4	37.49 .12	25.8 0.1	18.54 .14	51.1 1.0	32.95 .18	28.4 1.6	50.81 .31	53.4 2.2	28.76 .10	29.4 0.1
21.4	37.37 .14	25.7 0.1	18.40 .16	52.1 0.9	32.77 .21	30.0 1.4	50.50 .39	55.6 1.9	28.66 .13	29.5 0.3
31.3	37.23 .15	25.8 0.2	18.24 .18	53.0 0.8	32.56 .24	31.4 1.2	50.11 .45	57.5 1.5	28.53 .15	29.8 0.4
Apr. 10.3	37.08 .16	26.0 0.3	18.06 .18	53.8 0.7	32.32 .26	32.6 0.8	49.66 .47	59.0 1.0	28.38 .15	30.2 0.4
20.3	36.92 .16	26.3 0.4	17.88 .19	54.5 0.5	32.06 .25	33.4 0.5	49.19 .48	60.0 0.5	28.23 .16	30.6 0.4
30.3	36.76 .15	26.7 0.5	17.69 .17	55.0 0.4	31.81 .25	33.9 0.2	48.71 .47	60.5 0.0	28.07 .15	31.0 0.5
May 10.2	36.61 .13	27.2 0.5	17.52 .16	55.4 0.1	31.56 .22	34.1 0.1	48.24 .45	60.5 0.4	27.92 .13	31.5 0.5
20.2	36.48 .10	27.7 0.5	17.36 .13	55.5 0.0	31.34 .19	34.0 0.5	47.79 .40	60.1 0.9	27.79 .12	32.0 0.5
30.2	36.38 .08	28.2 0.6	17.23 .10	55.5ʳ 0.3	31.15 .16	33.5 0.8	47.39 .34	59.2 1.4	27.67 .09	32.5 0.4
June 9.2	36.30 .06	28.8 0.6	17.13 .07	55.2 0.3	30.99 .11	32.7 1.1	47.05 .27	57.8 1.7	27.58 .06	32.9 0.4
19.1	36.24 .02	29.4 0.6	17.06 .04	54.9 0.6	30.88 .07	31.6 1.4	46.78 .20	56.1 2.1	27.52 .04	33.3 0.4
29.1	36.22 .00	30.0 0.6	17.02 .00	54.3 0.7	30.81 .03	30.2 1.6	46.58 .12	54.0 2.4	27.48 .01	33.7 0.4
July 9.1	36.22 .03	30.6 0.6	17.02 .03	53.6 0.8	30.78 .02	28.6 1.7	46.46 .04	51.6 2.5	27.47 .01	34.1 0.3
19.0	36.25 .07	31.2 0.5	17.05 .07	52.8 0.9	30.80 .07	26.9 1.9	46.42 .04	49.1 2.8	27.48 .05	34.4 0.2
29.0	36.32 .09	31.7 0.4	17.12 .10	51.9 1.0	30.87 .11	25.0 2.0	46.46 .12	46.3 2.9	27.53 .07	34.6 0.2
Aug. 8.0	36.41 .12	32.1 0.3	17.22 .14	50.9 1.0	30.98 .15	23.0 2.1	46.58 .21	43.4 2.9	27.60 .10	34.8 0.0
18.0	36.53 .14	32.4 0.1	17.36 .16	49.8 1.1	31.13 .20	20.9 2.1	46.79 .29	40.5 2.9	27.70 .13	34.8 0.2
27.9	36.67 .17	32.5 0.0	17.52 .19	48.5 1.3	31.33 .23	18.8 2.1	47.08 .36	37.6 2.9	27.83 .16	34.6 0.3
Sept. 6.9	36.84 .20	32.5 0.3	17.71 .23	47.2 1.3	31.56 .28	16.7 2.1	47.44 .43	34.7 2.7	27.99 .19	34.3 0.5
16.9	37.04 .23	32.2 0.3	17.94 .25	45.9 1.5	31.84 .31	14.6 2.1	47.87 .49	32.0 2.6	28.18 .21	33.8 0.7
26.9	37.27 .25	31.8 0.4	18.19 .28	44.4 1.4	32.15 .35	12.5 1.9	48.36 .56	29.4 2.4	28.39 .24	33.1 0.9
Oct. 6.8	37.52 .27	31.1 0.7	18.47 .31	43.0 1.5	32.50 .38	10.6 1.8	48.92 .61	27.0 2.1	28.63 .26	32.2 1.1
16.8	37.79 .29	30.1 1.0	18.78 .33	41.5 1.5	32.88 .40	8.8 1.7	49.53 .66	24.9 1.7	28.89 .28	31.1 1.3
26.8	38.08 .30	28.9 1.3	19.11 .34	40.0 1.4	33.28 .43	7.1 1.4	50.19 .68	23.2 1.4	29.17 .31	29.8 1.5
Nov. 5.7	38.38 .30	27.6 1.5	19.45 .35	38.6 1.3	33.71 .43	5.7 1.1	50.87 .71	21.8 0.9	29.48 .31	28.3 1.6
15.7	38.68 .31	26.1 1.7	19.80 .36	37.3 1.2	34.14 .44	4.6 0.8	51.58 .71	20.9 0.4	29.79 .32	26.7 1.6
25.7	38.99 .30	24.4 1.7	20.16 .34	36.1 1.0	34.58 .43	3.8 0.4	52.29 .69	20.5 0.0	30.11 .31	25.1 1.6
Dec. 5.7	39.29 .29	22.7 1.7	20.50 .33	35.1 0.7	35.01 .41	3.4 0.1	52.98 .66	20.5 0.6	30.42 .30	23.5 1.6
15.6	39.58 .25	21.0 1.6	20.83 .31	34.4 0.5	35.42 .37	3.3 0.3	53.64 .60	21.1 1.0	30.72 .27	21.9 1.5
25.6	39.83 .22	19.4 1.6	21.14 .26	33.9 0.2	35.79 .33	3.6 0.3	54.24 .52	22.1 1.0	30.99 .25	20.4 1.5
35.6	40.05	17.9 1.5	21.40	33.7	36.12	4.3 0.7	54.76	23.6 1.5	31.24	19.0 1.4

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Hydræ. Right Ascension.	θ Hydræ. Declination North.	β Argûs. Right Ascension.	β Argûs. Declination South.	ι Argûs. Right Ascension.	ι Argûs. Declination South.	a Lyncis. Right Ascension.	a Lyncis. Declination North.	a Hydræ. Right Ascension.	a Hydræ. Declination South.
	h m 9 09	° ' +2 43	h m 9 12	° ' −69 18	h m 9 14	° ' −58 51	h m 9 15	° ' +34 47	h m 9 22	° ' −8 14
	s	"	s	"	s	"	s	"	s	"
Jan. 0.6	17.79 (.22)	30.0 (1.7)	11.74 (.35)	45.7 (3.6)	30.97 (.28)	48.0 (3.6)	7.11 (.27)	68.6 (0.1)	48.10 (.23)	8.8 (2.3)
10.6	18.01 (.17)	28.3 (1.5)	12.09 (.24)	49.3 (3.8)	31.25 (.20)	51.6 (3.8)	7.38 (.22)	68.7 (0.3)	48.33 (.18)	11.1 (2.2)
20.6	18.18 (.13)	26.8 (1.4)	12.33 (.11)	53.1 (3.9)	31.45 (.11)	55.4 (3.8)	7.60 (.16)	69.0 (0.6)	48.51 (.13)	13.3 (2.0)
30.5	18.31 (.08)	25.4 (1.1)	12.44 (.00)	57.0 (3.9)	31.56 (.04)	59.2 (3.8)	7.76 (.10)	69.6 (0.8)	48.64 (.08)	15.3 (1.8)
Feb. 9.5	18.39 (.02)	24.3 (0.9)	12.44 (.11)	60.9 (3.7)	31.60 (.05)	63.0 (3.6)	7.86 (.04)	70.4 (1.1)	48.72 (.04)	17.1 (1.5)
19.5	18.41 (.02)	23.4 (0.7)	12.33 (.22)	64.6 (3.5)	31.55 (.12)	66.6 (3.4)	7.90 (.02)	71.5 (1.2)	48.76 (.01)	18.6 (1.3)
Mar. 1.5	18.39 (.06)	22.7 (0.4)	12.11 (.31)	68.1 (3.3)	31.43 (.19)	70.0 (3.1)	7.88 (.07)	72.7 (1.3)	48.75 (.06)	19.9 (1.0)
11.4	18.33 (.10)	22.3 (0.3)	11.80 (.40)	71.4 (2.9)	31.24 (.25)	73.1 (2.7)	7.81 (.11)	74.0 (1.2)	48.69 (.09)	20.9 (0.8)
21.4	18.23 (.12)	22.0 (0.0)	11.40 (.47)	74.3 (2.5)	30.99 (.30)	75.8 (2.3)	7.70 (.15)	75.2 (1.2)	48.60 (.11)	21.7 (0.6)
31.4	18.11 (.14)	22.0 (0.1)	10.93 (.51)	76.8 (2.1)	30.69 (.33)	78.1 (1.9)	7.55 (.18)	76.4 (1.1)	48.49 (.14)	22.3 (0.3)
Apr. 10.3	17.97 (.15)	22.1 (0.2)	10.42 (.55)	78.9 (1.5)	30.36 (.35)	80.0 (1.4)	7.37 (.19)	77.5 (0.9)	48.35 (.15)	22.6 (0.0)
20.3	17.82 (.15)	22.3 (0.4)	9.87 (.57)	80.4 (1.0)	30.01 (.37)	81.4 (0.8)	7.18 (.19)	78.4 (0.7)	48.20 (.15)	22.6 (0.1)
30.3	17.67 (.15)	22.7 (0.4)	9.30 (.57)	81.4 (0.5)	29.64 (.36)	82.2 (0.4)	6.99 (.18)	79.1 (0.5)	48.05 (.15)	22.5 (0.4)
May 10.3	17.52 (.13)	23.1 (0.6)	8.73 (.57)	81.9 (0.0)	29.28 (.36)	82.6 (0.2)	6.81 (.18)	79.6 (0.3)	47.90 (.13)	22.1 (0.5)
20.2	17.39 (.11)	23.7 (0.6)	8.16 (.54)	81.9 (0.6)	28.92 (.34)	82.4 (0.7)	6.63 (.15)	79.9 (0.0)	47.77 (.12)	21.6 (0.7)
30.2	17.28 (.10)	24.3 (0.7)	7.62 (.50)	81.3 (1.1)	28.58 (.31)	81.7 (1.2)	6.48 (.12)	79.9 (0.2)	47.65 (.11)	20.9 (0.9)
June 9.2	17.18 (.07)	25.0 (0.7)	7.12 (.45)	80.2 (1.6)	28.27 (.27)	80.5 (1.6)	6.36 (.10)	79.7 (0.4)	47.54 (.08)	20.0 (1.0)
19.2	17.11 (.04)	25.7 (0.7)	6.67 (.39)	78.6 (2.0)	28.00 (.23)	78.9 (2.0)	6.26 (.06)	79.3 (0.6)	47.46 (.06)	19.0 (1.1)
29.1	17.07 (.02)	26.4 (0.7)	6.28 (.32)	76.6 (2.4)	27.77 (.19)	76.9 (2.4)	6.20 (.03)	78.7 (0.8)	47.40 (.04)	17.9 (1.2)
July 9.1	17.05 (.01)	27.1 (0.8)	5.96 (.24)	74.2 (2.7)	27.58 (.13)	74.5 (2.7)	6.17 (.00)	77.9 (1.0)	47.36 (.01)	16.7 (1.3)
19.1	17.06 (.03)	27.9 (0.6)	5.72 (.15)	71.5 (3.0)	27.45 (.08)	71.8 (2.9)	6.17 (.04)	76.9 (1.2)	47.35 (.02)	15.4 (1.2)
29.0	17.09 (.07)	28.5 (0.6)	5.57 (.06)	68.5 (3.1)	27.37 (.01)	68.9 (3.0)	6.21 (.07)	75.7 (1.3)	47.37 (.04)	14.2 (1.2)
Aug. 8.0	17.16 (.09)	29.1 (0.5)	5.51 (.04)	65.4 (3.1)	27.36 (.05)	65.9 (3.0)	6.28 (.10)	74.4 (1.4)	47.41 (.07)	13.0 (1.0)
18.0	17.25 (.11)	29.6 (0.3)	5.55 (.15)	62.3 (3.1)	27.41 (.12)	62.9 (3.0)	6.38 (.14)	73.0 (1.4)	47.48 (.10)	12.0 (0.9)
28.0	17.36 (.15)	29.9 (0.1)	5.70 (.25)	59.2 (2.9)	27.53 (.19)	59.9 (2.7)	6.52 (.17)	71.5 (1.7)	47.58 (.14)	11.1 (0.7)
Sept. 6.9	17.51 (.18)	30.0 (0.1)	5.95 (.35)	56.3 (2.6)	27.72 (.25)	57.2 (2.4)	6.69 (.21)	69.8 (1.7)	47.72 (.16)	10.4 (0.5)
16.9	17.69 (.20)	29.9 (0.4)	6.30 (.44)	53.7 (2.2)	27.97 (.32)	54.8 (2.1)	6.90 (.24)	68.1 (1.7)	47.88 (.19)	9.9 (0.2)
26.9	17.89 (.23)	29.5 (0.6)	6.74 (.53)	51.5 (1.8)	28.29 (.37)	52.7 (1.5)	7.14 (.26)	66.4 (1.8)	48.07 (.22)	9.7 (0.2)
Oct. 6.9	18.12 (.26)	28.9 (0.9)	7.27 (.59)	49.7 (1.2)	28.66 (.43)	51.2 (1.0)	7.40 (.30)	64.6 (1.8)	48.29 (.25)	9.9 (0.5)
16.8	18.38 (.27)	28.0 (1.1)	7.86 (.65)	48.5 (0.5)	29.09 (.46)	50.2 (0.4)	7.70 (.33)	62.8 (1.7)	48.54 (.27)	10.4 (0.9)
26.8	18.65 (.30)	26.9 (1.4)	8.51 (.68)	48.0 (0.1)	29.55 (.49)	49.8 (0.3)	8.03 (.35)	61.1 (1.7)	48.81 (.29)	11.3 (1.2)
Nov. 5.8	18.95 (.30)	25.5 (1.6)	9.19 (.69)	48.1 (0.7)	30.04 (.50)	50.1 (0.9)	8.38 (.36)	59.4 (1.5)	49.10 (.31)	12.5 (1.6)
15.7	19.25 (.31)	23.9 (1.8)	9.88 (.68)	48.8 (1.5)	30.54 (.49)	51.0 (1.6)	8.74 (.37)	57.9 (1.3)	49.41 (.31)	14.1 (1.8)
25.7	19.56 (.31)	22.1 (1.9)	10.56 (.64)	50.3 (2.0)	31.03 (.48)	52.6 (2.1)	9.11 (.37)	56.6 (1.1)	49.72 (.31)	15.9 (2.0)
Dec. 5.7	19.87 (.30)	20.2 (1.9)	11.20 (.59)	52.3 (2.6)	31.51 (.44)	54.7 (2.7)	9.48 (.35)	55.5 (0.8)	50.03 (.30)	17.9 (2.2)
15.7	20.17 (.27)	18.3 (1.8)	11.79 (.50)	54.9 (3.1)	31.95 (.38)	57.4 (3.1)	9.83 (.33)	54.7 (0.5)	50.33 (.28)	20.1 (2.3)
25.6	20.44 (.24)	16.5 (1.8)	12.29 (.41)	58.0 (3.4)	32.33 (.33)	60.5 (3.4)	10.16 (.30)	54.2 (0.2)	50.61 (.24)	22.4 (2.3)
35.6	20.68	14.7	12.70	61.4	32.66	63.9	10.46	54.0	50.85	24.7

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	1 Draconis (H.) RA 9 23	1 Draconis (H.) Dec. N. +81 44	d Ursæ Majoris RA 9 25	d Ursæ Majoris Dec. N. +70 15	θ Ursæ Majoris RA 9 26	θ Ursæ Majoris Dec. N. +52 06	10 Leonis Minoris RA 9 28	10 Leonis Minoris Dec. N. +36 49	o Leonis RA 9 35	o Leonis Dec. N. +10 19
	h m / s	° ' / "	h m / s	° ' / "	h m / s	° ' / "	h m / s	° ' / "	h m / s	° ' / "
Jan. 0.6	15.57 (1.18)	73.8 (2.0)	52.79 (.56)	18.9 (1.6)	20.52 (.35)	67.1 (0.8)	15.17 (.28)	40.5 (0.1)	56.95 (.25)	66.0 (1.4)
10.6	16.75 (0.94)	75.8 (2.5)	53.35 (.46)	20.5 (2.1)	20.87 (.28)	67.9 (1.2)	15.45 (.24)	40.6 (0.3)	57.20 (.20)	64.6 (1.2)
20.6	17.69 (0.66)	78.3 (2.7)	53.81 (.33)	22.6 (2.3)	21.15 (.21)	69.1 (1.5)	15.69 (.18)	40.9 (0.7)	57.40 (.16)	63.4 (0.9)
30.5	18.35 (0.35)	81.0 (3.0)	54.14 (.19)	24.9 (2.6)	21.36 (.13)	70.6 (1.8)	15.87 (.12)	41.6 (1.0)	57.56 (.10)	62.5 (0.7)
Feb. 9.5	18.70 (0.05)	84.0 (3.1)	54.33 (.06)	27.5 (2.8)	21.49 (.06)	72.4 (2.0)	15.99 (.05)	42.6 (1.2)	57.66 (.06)	61.8 (0.5)
19.5	18.75 (0.27)	87.1 (3.0)	54.39 (.07)	30.3 (2.7)	21.55 (.02)	74.4 (2.0)	16.04 (.00)	43.8 (1.3)	57.72 (.01)	61.3 (0.2)
Mar. 1.5	18.48 (0.55)	90.1 (2.8)	54.32 (.20)	33.0 (2.7)	21.53 (.10)	76.4 (2.1)	16.04 (.06)	45.1 (1.4)	57.73 (.04)	61.1 (0.0)
11.4	17.93 (0.81)	92.9 (2.6)	54.12 (.31)	35.7 (2.4)	21.43 (.15)	78.5 (1.9)	15.98 (.10)	46.5 (1.4)	57.69 (.08)	61.1 (0.2)
21.4	17.12 (1.03)	95.5 (2.2)	53.81 (.41)	38.1 (2.2)	21.28 (.20)	80.4 (1.8)	15.88 (.15)	47.9 (1.3)	57.61 (.10)	61.3 (0.3)
31.4	16.09 (1.19)	97.7 (1.8)	53.40 (.47)	40.3 (1.7)	21.08 (.24)	82.2 (1.5)	15.73 (.17)	49.2 (1.2)	57.51 (.13)	61.6 (0.4)
Apr. 10.4	14.90 (1.31)	99.5 (1.2)	52.93 (.52)	42.0 (1.3)	20.84 (.27)	83.7 (1.2)	15.56 (.18)	50.4 (1.1)	57.38 (.14)	62.0 (0.4)
20.3	13.59 (1.38)	100.7 (0.7)	52.41 (.55)	43.3 (0.8)	20.57 (.27)	84.9 (0.9)	15.38 (.20)	51.5 (0.8)	57.24 (.14)	62.4 (0.5)
30.3	12.21 (1.39)	101.4 (0.1)	51.86 (.55)	44.1 (0.4)	20.30 (.27)	85.8 (0.5)	15.18 (.19)	52.3 (0.6)	57.10 (.15)	62.9 (0.6)
May 10.3	10.82 (1.35)	101.5 (0.5)	51.31 (.52)	44.5 (0.2)	20.03 (.26)	86.3 (0.1)	14.99 (.18)	52.9 (0.3)	56.95 (.13)	63.5 (0.5)
20.2	9.47 (1.26)	101.0 (1.0)	50.79 (.49)	44.3 (0.7)	19.77 (.24)	86.4 (0.3)	14.81 (.16)	53.2 (0.1)	56.82 (.12)	64.0 (0.6)
30.2	8.21 (1.14)	100.0 (1.5)	50.30 (.44)	43.6 (1.2)	19.53 (.20)	86.1 (0.7)	14.65 (.14)	53.3 (0.2)	56.70 (.11)	64.6 (0.5)
June 9.2	7.07 (0.99)	98.5 (2.0)	49.86 (.37)	42.4 (1.6)	19.33 (.17)	85.4 (1.0)	14.51 (.11)	53.1 (0.4)	56.59 (.08)	65.1 (0.5)
19.2	6.08 (0.80)	96.5 (2.4)	49.49 (.29)	40.8 (2.0)	19.16 (.13)	84.4 (1.3)	14.40 (.08)	52.7 (0.7)	56.51 (.06)	65.6 (0.5)
29.1	5.28 (0.60)	94.1 (2.7)	49.20 (.21)	38.8 (2.3)	19.03 (.08)	83.1 (1.6)	14.32 (.04)	52.0 (0.9)	56.45 (.04)	66.0 (0.4)
July 9.1	4.68 (0.38)	91.4 (3.0)	48.99 (.12)	36.5 (2.6)	18.95 (.03)	81.5 (1.8)	14.28 (.01)	51.1 (1.1)	56.41 (.01)	66.4 (0.3)
19.1	4.30 (0.16)	88.4 (3.2)	48.87 (.03)	33.9 (2.9)	18.92 (.01)	79.7 (2.1)	14.27 (.02)	50.0 (1.2)	56.40 (.01)	66.7 (0.2)
29.1	4.14 (0.07)	85.2 (3.3)	48.84 (.06)	31.0 (3.0)	18.93 (.06)	77.6 (2.2)	14.29 (.06)	48.8 (1.4)	56.41 (.04)	66.9 (0.1)
Aug. 8.0	4.21 (0.29)	81.9 (3.4)	48.90 (.15)	28.0 (3.0)	18.99 (.10)	75.4 (2.4)	14.35 (.09)	47.4 (1.6)	56.45 (.07)	67.0 (0.0)
18.0	4.50 (0.52)	78.5 (3.4)	49.05 (.24)	24.9 (3.1)	19.09 (.15)	73.0 (2.5)	14.44 (.12)	45.8 (1.7)	56.52 (.09)	67.0 (0.2)
28.0	5.02 (0.73)	75.1 (3.3)	49.29 (.34)	21.8 (3.1)	19.24 (.20)	70.5 (2.5)	14.56 (.16)	44.1 (1.7)	56.61 (.13)	66.8 (0.3)
Sept. 6.9	5.75 (0.93)	71.8 (3.2)	49.63 (.41)	18.7 (3.0)	19.44 (.25)	68.0 (2.4)	14.72 (.20)	42.4 (1.9)	56.74 (.15)	66.5 (0.6)
16.9	6.68 (1.12)	68.6 (3.0)	50.04 (.50)	15.7 (2.8)	19.69 (.29)	65.6 (2.5)	14.92 (.23)	40.5 (1.9)	56.89 (.19)	65.9 (0.8)
26.9	7.80 (1.30)	65.6 (2.7)	50.54 (.57)	12.9 (2.7)	19.98 (.33)	63.1 (2.4)	15.15 (.26)	38.6 (2.0)	57.08 (.21)	65.1 (0.9)
Oct. 6.9	9.10 (1.45)	62.9 (2.4)	51.11 (.64)	10.2 (2.4)	20.31 (.37)	60.7 (2.2)	15.41 (.30)	36.6 (1.9)	57.29 (.25)	64.2 (1.2)
16.8	10.55 (1.57)	60.5 (1.9)	51.75 (.70)	7.8 (2.0)	20.68 (.40)	58.5 (2.0)	15.71 (.32)	34.7 (1.9)	57.54 (.27)	63.0 (1.4)
26.8	12.12 (1.67)	58.6 (1.5)	52.45 (.74)	5.8 (1.7)	21.08 (.44)	56.5 (1.8)	16.03 (.35)	32.8 (1.8)	57.81 (.29)	61.6 (1.5)
Nov. 5.8	13.79 (1.73)	57.1 (1.0)	53.19 (.78)	4.1 (1.2)	21.52 (.46)	54.7 (1.5)	16.38 (.37)	31.0 (1.6)	58.10 (.31)	60.1 (1.7)
15.8	15.52 (1.74)	56.1 (0.5)	53.97 (.79)	2.9 (0.8)	21.98 (.46)	53.2 (1.1)	16.75 (.38)	29.4 (1.4)	58.41 (.32)	58.4 (1.8)
25.7	17.26 (1.72)	55.6 (0.1)	54.76 (.78)	2.1 (0.2)	22.44 (.47)	52.1 (0.8)	17.13 (.38)	28.0 (1.1)	58.73 (.32)	56.6 (1.8)
Dec. 5.7	18.98 (1.64)	55.7 (0.7)	55.54 (.75)	1.9 (0.3)	22.91 (.45)	51.3 (0.3)	17.51 (.37)	26.9 (0.9)	59.05 (.31)	54.8 (1.7)
15.7	20.62 (1.50)	56.4 (1.3)	56.29 (.70)	2.2 (0.9)	23.36 (.42)	51.0 (0.1)	17.88 (.34)	26.0 (0.5)	59.36 (.29)	53.1 (1.7)
25.6	22.12 (1.33)	57.7 (1.8)	56.99 (.62)	3.1 (1.3)	23.78 (.38)	51.1 (0.6)	18.22 (.31)	25.5 (0.2)	59.65 (.27)	51.4 (1.5)
35.6	23.45	59.5	57.61	4.4	24.16	51.7	18.53	25.3	59.92	49.9

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APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Chamæleontis.		ε Leonis.		μ Leonis.		19 Leonis Minoris.		π Leonis.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 9 36	° ' −80 29	h m 9 40	+24 13	h m 9 47	+26 27	h m 9 51	+41 30	h m 9 55	+ 8 30
	s	"	s	"	s	"	s	"	s	"
Jan. 0.6	54.76 (0.76)	57.6 (3.4)	19.07	16.7 (0.7)	13.11 (.27)	51.2 (0.7)	42.79 (.32)	61.8 (0.1)	3.71 (.25)	40.8 (1.6)
10.6	55.52 (0.54)	61.0 (3.6)	19.34 (.27)	16.0 (0.4)	13.38 (.24)	50.5 (0.3)	43.11 (.27)	61.9 (0.5)	3.96 (.22)	39.2 (1.3)
20.6	56.06 (0.31)	64.6 (3.8)	19.56 (.22)	15.6 (0.1)	13.62 (.18)	50.2 (0.0)	43.38 (.22)	62.4 (0.8)	4.18 (.18)	37.9 (1.1)
30.6	56.37 (0.06)	68.4 (3.9)	19.74 (.18)	15.5 (0.1)	13.80 (.13)	50.2 (0.3)	43.60 (.15)	63.2 (1.2)	4.36 (.12)	36.8 (0.9)
Feb. 9.5	56.43 (0.16)	72.3 (3.9)	19.86 (.12) (.06)	15.6 (0.1) (0.4)	13.93 (.07)	50.5 (0.5)	43.75 (.08)	64.4 (1.4)	4.48 (.07)	35.9 (0.5)
19.5	56.27 (0.39)	76.2 (3.7)	19.92 (.01)	16.0 (0.6)	14.00 (.02)	51.0 (0.8)	43.83 (.03)	65.8 (1.6)	4.55 (.03)	35.4 (0.4)
Mar. 1.5	55.88 (0.59)	79.9 (3.5)	19.93 (.03)	16.6 (0.8)	14.02 (.03)	51.8 (0.9)	43.86 (.04)	67.4 (1.7)	4.58 (.02)	35.0 (0.1)
11.4	55.29 (0.77)	83.4 (3.3)	19.90 (.08)	17.4 (0.9)	13.99 (.07)	52.7 (1.0)	43.82 (.09)	69.1 (1.7)	4.56 (.06)	34.9 (0.1)
21.4	54.52 (0.93)	86.7 (2.9)	19.82 (.11)	18.3 (0.9)	13.92 (.11)	53.7 (1.0)	43.73 (.13)	70.8 (1.6)	4.50 (.09)	35.0 (0.2)
31.4	53.59 (1.05)	89.6 (2.5)	19.71 (.14)	19.2 (0.9)	13.81 (.14)	54.7 (1.0)	43.60 (.17)	72.4 (1.5)	4.41 (.11)	35.2 (0.3)
Apr. 10.4	52.54 (1.16)	92.1 (2.1)	19.57 (.15)	20.1 (0.8)	13.67 (.15)	55.7 (0.9)	43.43 (.19)	73.9 (1.3)	4.30 (.13)	35.5 (0.5)
20.3	51.38 (1.23)	94.2 (1.6)	19.42 (.16)	20.9 (0.8)	13.52 (.16)	56.6 (0.9)	43.24 (.20)	75.2 (1.1)	4.17 (.13)	36.0 (0.5)
30.3	50.15 (1.27)	95.8 (1.0)	19.26 (.16)	21.7 (0.7)	13.36 (.16)	57.5 (0.7)	43.04 (.21)	76.3 (0.8)	4.04 (.14)	36.5 (0.5)
May 10.3	48.88 (1.28)	96.8 (0.5)	19.10 (.15)	22.4 (0.5)	13.20 (.16)	58.2 (0.5)	42.83 (.20)	77.1 (0.5)	3.90 (.14)	37.0 (0.5)
20.3	47.60 (1.27)	97.3 (0.0)	18.95 (.14)	22.9 (0.3)	13.04 (.14)	58.7 (0.4)	42.63 (.18)	77.6 (0.1)	3.76 (.12)	37.6 (0.6)
30.2	46.33 (1.21)	97.3 (0.5)	18.81 (.11)	23.2 (0.2)	12.90 (.12)	59.1 (0.2)	42.45 (.16)	77.7 (0.1)	3.64 (.11)	38.2 (0.6)
June 9.2	45.12 (1.14)	96.8 (1.1)	18.70 (.10)	23.4 (0.1)	12.78 (.10)	59.3 (0.0)	42.29 (.14)	77.6 (0.4)	3.53 (.09)	38.8 (0.5)
19.2	43.98 (1.03)	95.7 (1.6)	18.60 (.07)	23.5 (0.1)	12.68 (.08)	59.3 (0.2)	42.15 (.11)	77.2 (0.8)	3.44 (.07)	39.3 (0.5)
29.1	42.95 (0.89)	94.1 (2.0)	18.53 (.04)	23.4 (0.2)	12.60 (.05)	59.1 (0.3)	42.04 (.08)	76.4 (1.0)	3.37 (.05)	39.8 (0.5)
July 9.1	42.06 (0.73)	92.1 (2.5)	18.49 (.02)	23.2 (0.4)	12.55 (.03)	58.8 (0.5)	41.96 (.04)	75.4 (1.2)	3.32 (.03)	40.3 (0.4)
19.1	41.33 (0.54)	89.6 (2.7)	18.47 (.01)	22.8 (0.6)	12.52 (.00)	58.3 (0.7)	41.92 (.01)	74.2 (1.5)	3.29 (.00)	40.7 (0.3)
29.1	40.79 (0.35)	86.9 (3.0)	18.48 (.04)	22.2 (0.7)	12.52 (.04)	57.6 (0.8)	41.91 (.02)	72.7 (1.7)	3.29 (.02)	41.0 (0.3)
Aug. 8.0	40.44 (0.12)	83.9 (3.1)	18.52 (.07)	21.5 (0.8)	12.56 (.06)	56.8 (1.0)	41.93 (.06)	71.0 (1.8)	3.31 (.05)	41.2 (0.0)
18.0	40.32 (0.11)	80.8 (3.1)	18.59 (.10)	20.7 (1.0)	12.62 (.09)	55.8 (1.2)	41.99 (.10)	69.2 (2.0)	3.36 (.07)	41.2 (0.1)
28.0	40.43 (0.34)	77.7 (3.1)	18.69 (.13)	19.7 (1.2)	12.71 (.13)	54.6 (1.3)	42.09 (.14)	67.2 (2.1)	3.43 (.11)	41.1 (0.3)
Sept. 7.0	40.77 (0.57)	74.6 (2.9)	18.82 (.16)	18.5 (1.3)	12.84 (.15)	53.3 (1.4)	42.23 (.18)	65.1 (2.2)	3.54 (.13)	40.8 (0.4)
16.9	41.34 (0.78)	71.7 (2.5)	18.98 (.20)	17.2 (1.4)	12.99 (.19)	51.9 (1.6)	42.41 (.21)	62.9 (2.2)	3.67 (.17)	40.4 (0.7)
26.9	42.12 (0.98)	69.2 (2.1)	19.18 (.22)	15.8 (1.6)	13.18 (.23)	50.3 (1.7)	42.62 (.26)	60.7 (2.3)	3.84 (.20)	39.7 (1.0)
Oct. 6.9	43.10 (1.14)	67.1 (1.7)	19.40 (.26)	14.2 (1.7)	13.41 (.25)	48.6 (1.7)	42.88 (.29)	58.4 (2.2)	4.04 (.23)	38.7 (1.1)
16.8	44.24 (1.27)	65.4 (1.1)	19.66 (.29)	12.5 (1.7)	13.66 (.29)	46.9 (1.9)	43.17 (.32)	56.2 (2.2)	4.27 (.26)	37.6 (1.4)
26.8	45.51 (1.36)	64.3 (0.4)	19.95 (.31)	10.8 (1.8)	13.95 (.31)	45.0 (1.8)	43.49 (.36)	54.0 (2.0)	4.53 (.28)	36.2 (1.6)
Nov. 5.8	46.87 (1.39)	63.9 (0.2)	20.26 (.32)	9.0 (1.7)	14.26 (.33)	43.2 (1.8)	43.85 (.38)	52.0 (1.8)	4.81 (.30)	34.6 (1.7)
15.8	48.26 (1.39)	64.1 (0.9)	20.58 (.34)	7.3 (1.7)	14.59 (.34)	41.4 (1.7)	44.23 (.40)	50.2 (1.6)	5.11 (.32)	32.9 (1.8)
25.7	49.65 (1.33)	65.0 (1.6)	20.92 (.35)	5.6 (1.5)	14.93 (.35)	39.7 (1.6)	44.63 (.40)	48.6 (1.3)	5.43 (.32)	31.1 (1.9)
Dec. 5.7	50.98 (1.22)	66.6 (2.1)	21.27 (.33)	4.1 (1.4)	15.28 (.34)	38.1 (1.3)	45.03 (.39)	47.3 (0.9)	5.75 (.32)	29.2 (1.9)
15.7	52.20 (1.07)	68.7 (2.6)	21.60 (.32)	2.7 (1.2)	15.62 (.33)	36.8 (1.1)	45.42 (.38)	46.4 (0.6)	6.07 (.30)	27.3 (1.8)
25.7	53.27 (0.88)	71.3 (3.1)	21.92 (.29)	1.5 (0.8)	15.95 (.29)	35.7 (1.1)	45.80 (.35)	45.8 (0.1)	6.37 (.28)	25.5 (1.6)
35.6	54.15	74.4	22.21	0.7	16.24	34.9 (0.8)	46.15	45.7	6.65	23.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Leonis. (*Regulus.*) Right Ascension.	α Leonis. Declination *North.*	32 Ursæ Majoris. Right Ascension.	32 Ursæ Majoris. Declination *North.*	λ Ursæ Majoris. Right Ascension.	λ Ursæ Majoris. Declination *North.*	γ¹ Leonis. Right Ascension.	γ¹ Leonis. Declination *North.*	μ Hydræ. Right Ascension.	μ Hydræ. Declination *South.*
	h m 10 03	° ' +12 26	h m 10 10	° ' +65 35	h m 10 11	° ' +43 23	h m 10 14	° ' +20 19	h m 10 21	° ' −16 20
	s	''	s	''	s	''	s	''	s	''
Jan. 0.7	10.77 .26	34.1 1.4	57.46 .54	27.5 0.9	12.95 .34	54.3 0.0	35.71 .28	60.0 1.1	22.64 .27	13.1 2.5
10.6	11.03 .23	32.7 1.2	58.00 .46	28.4 1.5	13.29 .30	54.3 0.4	35.99 .25	58.9 0.8	22.91 .23	15.6 2.5
20.6	11.26 .19	31.5 0.9	58.46 .38	29.9 1.9	13.59 .24	54.7 0.8	36.24 .20	58.1 0.5	23.14 .19	18.1 2.5
30.6	11.45 .13	30.6 0.6	58.84 .27	31.8 2.2	13.83 .18	55.5 1.2	36.44 .15	57.6 0.2	23.33 .15	20.6 2.3
Feb. 9.5	11.58 .08	30.0 0.4	59.11 .16	34.0 2.6	14.01 .12	56.7 1.5	36.59 .10	57.4 0.1	23.48 .09	22.9 2.0
19.5	11.66 .04	29.6 0.1	59.27 .05	36.6 2.6	14.13 .05	58.2 1.7	36.69 .05	57.5 0.4	23.57 .04	24.9 1.9
Mar. 1.5	11.70 .01	29.5 0.1	59.32 .06	39.2 2.7	14.18 .02	59.9 1.8	36.74 .00	57.9 0.6	23.61 .00	26.8 1.6
11.5	11.69 .05	29.6 0.1	59.26 .16	41.9 2.6	14.16 .07	61.7 1.9	36.74 .04	58.5 0.7	23.61 .04	28.4 1.4
21.4	11.64 .09	29.9 0.3	59.10 .24	44.5 2.4	14.09 .11	63.6 1.8	36.70 .08	59.2 0.8	23.57 .07	29.8 1.0
31.4	11.55 .11	30.4 0.5	58.86 .31	46.9 2.2	13.98 .16	65.4 1.7	36.62 .10	60.0 0.9	23.50 .10	30.8 0.8
Apr. 10.4	11.44 .13	30.9 0.6	58.55 .37	49.1 1.8	13.82 .19	67.1 1.4	36.52 .13	60.9 0.9	23.40 .11	31.6 0.5
20.4	11.31 .13	31.5 0.6	58.18 .41	50.9 1.4	13.63 .20	68.5 1.3	36.39 .14	61.8 0.9	23.29 .13	32.1 0.3
30.3	11.18 .14	32.1 0.6	57.77 .42	52.3 0.9	13.43 .21	69.8 1.0	36.25 .14	62.7 0.8	23.16 .14	32.4 0.0
May 10.3	11.04 .14	32.7 0.6	57.35 .42	53.2 0.4	13.22 .20	70.8 0.6	36.11 .14	63.5 0.6	23.02 .14	32.4 0.3
20.3	10.90 .12	33.3 0.6	56.93 .41	53.6 0.1	13.02 .20	71.4 0.3	35.97 .14	64.1 0.6	22.88 .13	32.1 0.5
30.2	10.78 .12	33.9 0.6	56.52 .39	53.5 0.5	12.82 .18	71.7 0.0	35.83 .12	64.7 0.4	22.75 .12	31.6 0.7
June 9.2	10.66 .09	34.5 0.4	56.13 .34	53.0 1.0	12.64 .16	71.7 0.4	35.71 .10	65.1 0.3	22.63 .12	30.9 0.9
19.2	10.57 .03	34.9 0.4	55.79 .30	52.0 1.5	12.48 .13	71.3 0.6	35.61 .09	65.4 0.2	22.51 .09	30.0 1.1
29.2	10.49 .06	35.3 0.3	55.49 .24	50.5 1.8	12.35 .10	70.7 1.0	35.52 .07	65.6 0.0	22.42 .08	28.9 1.3
July 9.1	10.43 .03	35.6 0.2	55.25 .18	48.7 2.2	12.25 .07	69.7 1.3	35.45 .04	65.6 0.2	22.34 .06	27.6 1.3
19.1	10.40 .01	35.8 0.1	55.07 .11	46.5 2.5	12.18 .04	68.4 1.5	35.41 .02	65.4 0.3	22.28 .04	26.3 1.4
29.1	10.39 .01	35.9 0.0	54.96 .05	44.0 2.8	12.14 .00	66.9 1.7	35.39 .00	65.1 0.5	22.24 .02	24.9 1.4
Aug. 8.1	10.40 .04	35.9 0.2	54.91 .02	41.2 2.9	12.14 .04	65.2 2.0	35.39 .04	64.6 0.7	22.22 .01	23.5 1.4
18.0	10.44 .07	35.7 0.4	54.93 .09	38.3 3.1	12.18 .07	63.2 2.1	35.43 .06	63.9 0.8	22.23 .04	22.1 1.3
28.0	10.51 .10	35.3 0.5	55.02 .17	35.2 3.2	12.25 .11	61.1 2.2	35.49 .09	63.1 1.0	22.27 .08	20.8 1.1
Sept. 7.0	10.61 .13	34.8 0.7	55.19 .24	32.0 3.2	12.36 .16	58.9 2.4	35.58 .12	62.1 1.2	22.35 .10	19.7 0.9
16.9	10.74 .16	34.1 0.9	55.43 .31	28.8 3.1	12.52 .19	56.5 2.4	35.70 .16	60.9 1.4	22.45 .15	18.8 0.7
26.9	10.90 .20	33.2 1.1	55.74 .38	25.7 3.0	12.71 .24	54.1 2.5	35.86 .19	59.5 1.5	22.60 .18	18.1 0.3
Oct. 6.9	11.10 .22	32.1 1.4	56.12 .45	22.7 2.8	12.95 .28	51.6 2.4	36.05 .23	58.0 1.7	22.78 .21	17.8 0.1
16.9	11.32 .26	30.7 1.5	56.57 .52	19.9 2.6	13.23 .31	49.2 2.4	36.28 .25	56.3 1.8	22.99 .25	17.9 0.5
26.8	11.58 .28	29.2 1.7	57.09 .56	17.3 2.3	13.54 .35	46.8 2.2	36.53 .29	54.5 1.9	23.24 .27	18.4 0.8
Nov. 5.8	11.86 .31	27.5 1.8	57.65 .61	15.0 1.9	13.89 .38	44.6 2.0	36.82 .31	52.6 1.9	23.51 .31	19.2 1.3
15.8	12.17 .32	25.7 1.8	58.26 .64	13.1 1.5	14.27 .40	42.6 1.8	37.13 .33	50.7 1.9	23.82 .32	20.5 1.6
25.8	12.49 .32	23.9 1.9	58.90 .66	11.6 1.0	14.67 .41	40.8 1.4	37.46 .34	48.8 1.9	24.14 .32	22.1 2.0
Dec. 5.7	12.81 .32	22.0 1.8	59.56 .65	10.6 0.4	15.08 .41	39.4 1.1	37.80 .33	46.9 1.7	24.46 .33	24.1 2.1
15.7	13.13 .31	20.2 1.7	60.21 .63	10.2 0.1	15.49 .40	38.3 0.7	38.13 .33	45.2 1.4	24.79 .31	26.2 2.4
25.7	13.44 .29	18.5 1.5	60.84 .58	10.3 0.1	15.89 .37	37.6 0.2	38.46 .30	43.8 1.3	25.10 .28	28.6 2.5
35.6	13.73	17.0	61.42	11.0 0.7	16.26	37.4	38.76	42.5	25.38	31.1

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	β Leonis Minoris. Right Ascension.	Declination. North.	α Antliæ. Right Ascension.	Declination. South.	9 Draconis. (H.) Right Ascension.	Declination. North.	ρ Leonis. Right Ascension.	Declination. North.	41 Leonis Minoris. Right Ascension.	Declination. North.
	h m 10 22	° ′ +37 11	h m 10 22	° ′ −30 34	h m 10 26	° ′ +76 12	h m 10 27	° ′ + 9 48	h m 10 38	° ′ +23 41
	s	″	s	″	s	″	s	″	s	″
Jan. 0.7	14.59 .33	75.2 0.3	41.78 .29	8.0 2.9	49.18 0.90	40.3 1.2	40.53 .28	28.2 1.6	6.66 .30	50.2 1.1
10.6	14.92 .28	74.9 0.0	42.07 .24	10.9 3.0	50.08 0.79	41.5 1.6	40.81 .25	26.6 1.4	6.96 .27	49.1 0.8
20.6	15.20 .24	74.9 0.4	42.31 .20	13.9 3.0	50.87 0.64	43.1 2.2	41.06 .20	25.2 1.1	7.23 .23	48.3 0.3
30.6	15.44 .18	75.3 0.8	42.51 .14	16.9 3.0	51.51 0.47	45.3 2.6	41.26 .16	24.1 0.9	7.46 .18	48.0 0.1
Feb. 9.6	15.62 .12	76.1 1.1	42.65 .09	19.9 2.8	51.98 0.30	47.9 2.8	41.42 .10	23.2 0.5	7.64 .12	47.9 0.3
19.5	15.74 .07	77.2 1.4	42.74 .04	22.7 2.6	52.28 0.11	50.7 2.9	41.52 .06	22.7 0.3	7.76 .08	48.2 0.5
Mar. 1.5	15.81 .00	78.6 1.5	42.78 .00	25.3 2.3	52.39 0.08	53.6 3.0	41.58 .02	22.4 0.1	7.84 .02	48.7 0.8
11.5	15.81 .05	80.1 1.6	42.78 .05	27.6 2.1	52.31 0.25	56.6 2.9	41.60 .03	22.3 0.2	7.86 .02	49.5 1.0
21.4	15.76 .09	81.7 1.6	42.73 .09	29.7 1.8	52.06 0.40	59.5 2.7	41.57 .06	22.5 0.3	7.84 .06	50.5 1.0
31.4	15.67 .13	83.3 1.6	42.64 .11	31.5 1.5	51.66 0.54	62.2 2.4	41.51 .09	22.8 0.5	7.78 .09	51.5 1.2
Apr. 10.4	15.54 .15	84.9 1.4	42.53 .14	33.0 1.1	51.12 0.64	64.6 2.0	41.42 .11	23.3 0.5	7.69 .12	52.7 1.1
20.4	15.39 .18	86.3 1.3	42.39 .15	34.1 0.7	50.48 0.73	66.6 1.6	41.31 .12	23.8 0.6	7.57 .13	53.8 1.0
30.3	15.21 .18	87.6 1.0	42.24 .16	34.8 0.4	49.75 0.77	68.2 1.0	41.19 .13	24.4 0.7	7.44 .14	54.8 1.0
May 10.3	15.03 .18	88.6 0.8	42.08 .16	35.2 0.0	48.98 0.79	69.2 0.5	41.06 .13	25.1 0.6	7.30 .14	55.8 0.8
20.3	14.85 .17	89.4 0.5	41.92 .16	35.2 0.3	48.19 0.78	69.7 0.1	40.93 .13	25.7 0.6	7.16 .14	56.6 0.7
30.3	14.68 .16	89.9 0.2	41.76 .15	34.9 0.7	47.41 0.75	69.6 0.6	40.80 .11	26.3 0.6	7.02 .13	57.3 0.5
June 9.2	14.52 .14	90.1 0.1	41.61 .14	34.2 1.0	46.66 0.70	69.0 0.6	40.69 .10	26.9 0.6	6.89 .12	57.8 0.3
19.2	14.38 .12	90.0 0.4	41.47 .13	33.2 1.2	45.96 0.62	67.9 1.1	40.59 .09	27.5 0.5	6.77 .10	58.1 0.1
29.2	14.26 .10	89.6 0.7	41.34 .11	32.0 1.6	45.34 0.53	66.3 1.6	40.50 .07	28.0 0.5	6.67 .09	58.2 0.0
July 9.1	14.16 .07	88.9 0.9	41.23 .08	30.4 1.7	44.81 0.43	64.2 2.1	40.43 .05	28.4 0.4	6.58 .06	58.2 0.3
19.1	14.09 .04	88.0 1.2	41.15 .06	28.7 1.9	44.38 0.32	61.8 2.8	40.38 .03	28.8 0.2	6.52 .05	57.9 0.5
29.1	14.05 .01	86.8 1.4	41.09 .03	26.8 2.0	44.06 0.20	59.0 2.8	40.35 .01	29.0 0.1	6.47 .02	57.4 0.6
Aug. 8.1	14.04 .03	85.4 1.6	41.06 .00	24.8 2.0	43.86 0.08	56.0 3.0	40.34 .02	29.1 0.1	6.45 .01	56.8 0.8
18.0	14.07 .05	83.8 1.8	41.06 .03	22.7 2.1	43.78 0.06	52.7 3.3	40.36 .02	29.0 0.1	6.46 .04	56.0 0.8
28.0	14.12 .09	82.0 2.0	41.09 .07	20.8 1.9	43.84 0.18	49.3 3.4	40.40 .04	28.8 0.2	6.50 .06	54.9 1.1
Sept. 7.0	14.21 .13	80.0 2.1	41.16 .11	18.9 1.9	44.02 0.31	45.8 3.5	40.47 .11	28.4 0.4	6.56 .10	53.7 1.2
17.0	14.34 .17	77.9 2.2	41.27 .15	17.3 1.6	44.33 0.44	42.3 3.5	40.58 .14	27.8 0.6	6.66 .14	52.2 1.5
26.9	14.51 .21	75.7 2.3	41.42 .19	15.9 1.4	44.77 0.57	38.9 3.4	40.72 .17	27.0 0.8	6.80 .17	50.6 1.6
Oct. 6.9	14.72 .25	73.4 2.3	41.61 .23	14.9 1.0	45.34 0.68	35.6 3.3	40.89 .21	25.9 1.1	6.97 .20	48.9 1.7
16.9	14.97 .28	71.1 2.3	41.84 .27	14.3 0.6	46.02 0.80	32.5 3.1	41.10 .23	24.6 1.3	7.17 .25	47.0 1.9
26.8	15.25 .32	68.8 2.3	42.11 .30	14.2 0.1	46.82 0.89	29.7 2.8	41.33 .27	23.1 1.5	7.42 .27	45.0 2.0
Nov. 5.8	15.57 .35	66.5 2.1	42.41 .33	14.6 0.4	47.71 0.97	27.3 2.4	41.60 .30	21.5 1.6	7.69 .31	42.9 2.1
15.8	15.92 .37	64.4 1.9	42.74 .34	15.5 0.9	48.68 1.02	25.3 2.0	41.90 .31	19.6 1.9	8.00 .33	40.8 2.1
25.8	16.29 .38	62.5 1.7	43.08 .35	16.9 1.4	49.70 1.06	23.8 1.5	42.21 .32	17.7 1.9	8.33 .34	38.7 2.1
Dec. 5.7	16.67 .38	60.8 1.3	43.43 .35	18.7 1.8	50.76 1.06	22.8 1.0	42.53 .33	15.8 1.9	8.67 .34	36.8 1.9
15.7	17.05 .37	59.5 1.0	43.78 .33	20.9 2.2	51.82 1.03	22.4 0.4	42.86 .31	13.8 2.0	9.01 .34	35.1 1.7
25.7	17.42 .35	58.5 0.6	44.11 .31	23.4 2.5	52.85 0.96	22.6 0.2	43.17 .30	12.0 1.8	9.35 .32	33.5 1.6
35.7	17.77	57.9	44.42	26.2 2.8	53.81	23.4 0.8	43.47	10.3 1.7	9.67	32.3 1.2

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	η Argûs Right Ascension	η Argûs Declination South	ι Leonis Right Ascension	ι Leonis Declination North	δ² Chamæleontis Right Ascension	δ² Chamæleontis Declination South	46 Leonis Minoris Right Ascension	46 Leonis Minoris Declination North	Groombridge 1706 Right Ascension	Groombridge 1706 Declination North
	h m 10 41	° ′ −59 10	h m 10 44	° ′ +11 03	h m 10 44	° ′ −80 01	h m 10 47	° ′ +34 43	h m 10 52	° ′ +78 16
	s	″	s	″	s	″	s	″	s	″
Jan. 0.7	18.06 (.43)	1.6 (3.0)	7.74 (.29)	37.9 (1.6)	58.57 (1.05)	13.3 (2.8)	51.22 (.33)	77.7 (0.7)	9.47 (1.09)	78.0 (0.9)
10.6	18.49 (.36)	4.6 (3.3)	8.03 (.26)	36.3 (1.4)	59.62 (0.89)	16.1 (3.1)	51.55 (.31)	77.0 (0.3)	10.56 (0.99)	78.9 (1.5)
20.6	18.85 (.29)	7.9 (3.6)	8.29 (.22)	34.9 (1.1)	60.51 (0.70)	19.2 (3.5)	51.86 (.25)	76.7 (0.2)	11.55 (0.82)	80.4 (2.0)
30.6	19.14 (.21)	11.5 (3.7)	8.51 (.17)	33.8 (0.8)	61.21 (0.49)	22.7 (3.8)	52.11 (.21)	76.9 (0.5)	12.37 (0.64)	82.4 (2.4)
Feb. 9.6	19.35 (.14)	15.2 (3.7)	8.68 (.12)	33.0 (0.5)	61.70 (0.27)	26.5 (3.8)	52.32 (.14)	77.4 (0.9)	13.01 (0.45)	84.8 (2.7)
19.5	19.49 (.06)	18.9 (3.7)	8.80 (.08)	32.5 (0.2)	61.97 (0.07)	30.3 (3.9)	52.46 (.10)	78.3 (1.2)	13.46 (0.24)	87.5 (3.0)
Mar. 1.5	19.55 (.02)	22.6 (3.5)	8.88 (.03)	32.3 (0.0)	62.04 (0.14)	34.2 (3.9)	52.56 (.03)	79.5 (1.4)	13.70 (0.02)	90.5 (3.1)
11.5	19.53 (.08)	26.1 (3.3)	8.91 (.01)	32.3 (0.2)	61.90 (0.33)	38.1 (3.7)	52.59 (.01)	80.9 (1.5)	13.72 (0.19)	93.6 (3.0)
21.5	19.45 (.15)	29.4 (3.0)	8.90 (.05)	32.5 (0.4)	61.57 (0.50)	41.8 (3.5)	52.58 (.07)	82.4 (1.6)	13.53 (0.38)	96.6 (2.9)
31.4	19.30 (.20)	32.4 (2.7)	8.85 (.07)	32.9 (0.6)	61.07 (0.67)	45.3 (3.2)	52.51 (.09)	84.0 (1.6)	13.15 (0.55)	99.5 (2.6)
Apr. 10.4	19.10 (.24)	35.1 (2.3)	8.78 (.10)	33.5 (0.6)	60.40 (0.80)	48.5 (2.8)	52.42 (.13)	85.6 (1.6)	12.60 (0.70)	102.1 (2.3)
20.4	18.86 (.27)	37.4 (1.8)	8.68 (.12)	34.1 (0.7)	59.60 (0.92)	51.3 (2.4)	52.29 (.15)	87.2 (1.3)	11.90 (0.80)	104.4 (1.8)
30.3	18.59 (.30)	39.2 (1.4)	8.56 (.12)	34.8 (0.7)	58.68 (1.01)	53.7 (2.0)	52.14 (.16)	88.5 (1.2)	11.10 (0.89)	106.2 (1.3)
May 10.3	18.29 (.31)	40.6 (0.9)	8.44 (.13)	35.5 (0.7)	57.67 (1.08)	55.7 (1.4)	51.98 (.17)	89.7 (1.0)	10.21 (0.93)	107.5 (0.8)
20.3	17.98 (.32)	41.5 (0.4)	8.31 (.12)	36.2 (0.7)	56.59 (1.13)	57.1 (0.9)	51.81 (.16)	90.7 (0.7)	9.28 (0.94)	108.3 (0.2)
30.3	17.66 (.32)	41.9 (0.1)	8.19 (.11)	36.9 (0.6)	55.46 (1.14)	58.0 (0.4)	51.65 (.16)	91.4 (0.4)	8.34 (0.92)	108.5 (0.3)
June 9.2	17.34 (.31)	41.8 (0.6)	8.08 (.11)	37.5 (0.6)	54.32 (1.12)	58.4 (0.2)	51.49 (.14)	91.8 (0.1)	7.42 (0.88)	108.2 (0.8)
19.2	17.03 (.30)	41.2 (1.1)	7.97 (.10)	38.1 (0.5)	53.20 (1.09)	58.2 (0.7)	51.35 (.13)	91.9 (0.1)	6.54 (0.82)	107.4 (1.4)
29.2	16.73 (.27)	40.1 (1.6)	7.87 (.08)	38.6 (0.4)	52.11 (1.01)	57.5 (1.3)	51.22 (.11)	91.8 (0.4)	5.72 (0.72)	106.0 (1.9)
July 9.2	16.46 (.24)	38.5 (1.9)	7.79 (.06)	39.0 (0.3)	51.10 (0.91)	56.2 (1.7)	51.11 (.09)	91.4 (0.7)	5.00 (0.62)	104.1 (2.2)
19.1	16.22 (.20)	36.6 (2.3)	7.73 (.04)	39.3 (0.1)	50.19 (0.78)	54.5 (2.2)	51.02 (.06)	90.7 (1.0)	4.38 (0.50)	101.9 (2.7)
29.1	16.02 (.15)	34.3 (2.6)	7.69 (.03)	39.4 (0.1)	49.41 (0.63)	52.3 (2.6)	50.96 (.04)	89.7 (1.2)	3.88 (0.36)	99.2 (3.0)
Aug. 8.1	15.87 (.09)	31.7 (2.6)	7.66 (.01)	39.5 (0.1)	48.78 (0.44)	49.7 (2.6)	50.92 (.00)	88.5 (1.2)	3.52 (0.23)	96.2 (3.0)
18.0	15.78 (.03)	29.0 (2.7)	7.67 (.01)	39.3 (0.2)	48.34 (0.44)	46.9 (2.8)	50.92 (.00)	87.0 (1.5)	3.29 (0.23)	92.9 (3.3)
28.0	15.75 (.03)	26.1 (2.9)	7.70 (.03)	39.0 (0.3)	48.09 (0.25)	43.8 (3.1)	50.94 (.02)	85.3 (1.7)	3.21 (0.08)	89.5 (3.4)
Sept. 7.0	15.78 (.11)	23.2 (2.7)	7.75 (.09)	38.5 (0.7)	48.07 (0.20)	40.7 (3.1)	51.00 (.09)	83.5 (2.1)	3.28 (0.22)	85.9 (3.6)
17.0	15.89 (.19)	20.5 (2.6)	7.84 (.12)	37.8 (0.9)	48.27 (0.43)	37.6 (2.9)	51.09 (.14)	81.4 (2.2)	3.50 (0.38)	82.3 (3.6)
26.9	16.08 (.25)	17.9 (2.2)	7.96 (.16)	36.9 (1.1)	48.70 (0.64)	34.7 (2.7)	51.23 (.17)	79.2 (2.3)	3.88 (0.53)	78.7 (3.5)
Oct. 6.9	16.33 (.33)	15.7 (1.8)	8.12 (.19)	35.8 (1.4)	49.34 (0.85)	32.0 (2.4)	51.40 (.22)	76.9 (2.4)	4.41 (0.68)	75.2 (3.3)
16.9	16.66 (.39)	13.9 (1.3)	8.31 (.23)	34.4 (1.6)	50.19 (1.03)	29.6 (1.8)	51.62 (.25)	74.5 (2.4)	5.09 (0.82)	71.9 (3.0)
26.9	17.05 (.45)	12.6 (0.7)	8.54 (.26)	32.8 (1.7)	51.22 (1.18)	27.8 (1.3)	51.87 (.29)	72.1 (2.4)	5.91 (0.94)	68.9 (2.8)
Nov. 5.8	17.50 (.48)	11.9 (0.1)	8.80 (.29)	31.1 (1.9)	52.40 (1.28)	26.5 (0.7)	52.16 (.33)	69.7 (2.3)	6.85 (1.06)	66.1 (2.3)
15.8	17.98 (.52)	11.8 (0.1)	9.09 (.31)	29.2 (2.0)	53.68 (1.34)	25.8 (0.1)	52.49 (.35)	67.4 (2.1)	7.91 (1.14)	63.8 (1.8)
25.8	18.50 (.52)	12.3 (0.5)	9.40 (.32)	27.2 (1.9)	55.02 (1.37)	25.7 (0.6)	52.84 (.37)	65.3 (1.9)	9.05 (1.19)	62.0 (1.3)
Dec. 5.7	19.02 (.52)	13.4 (1.1)	9.72 (.33)	25.3 (2.0)	56.39 (1.33)	26.3 (1.3)	53.21 (.37)	63.4 (1.7)	10.24 (1.22)	60.7 (0.7)
15.7	19.54 (.49)	15.2 (1.8)	10.05 (.32)	23.3 (1.9)	57.72 (1.25)	27.6 (1.9)	53.58 (.37)	61.7 (1.3)	11.46 (1.21)	60.0 (0.1)
25.7	20.03 (.45)	17.4 (2.2)	10.37 (.30)	21.4 (1.7)	58.97 (1.14)	29.5 (2.4)	53.95 (.35)	60.4 (0.9)	12.67 (1.15)	59.9 (0.6)
35.7	20.48	20.2 (2.8)	10.67	19.7 (1.7)	60.11	31.9 (2.4)	54.30	59.5	13.82	60.5

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Majoris. Right Ascension.	a Ursæ Majoris. Declination North.	η Octantis. Right Ascension.	η Octantis. Declination South.	ρ¹ Leonis. Right Ascension.	ρ¹ Leonis. Declination North.	ψ Ursæ Majoris. Right Ascension.	ψ Ursæ Majoris. Declination North.	δ Leonis. Right Ascension.	δ Leonis. Declination North.
	h m 10 57	° ′ +62 16	h m 10 59	° ′ −84 03	h m 11 01	° ′ + 2 28	h m 11 04	° ′ +45 01	h m 11 08	° ′ +21 03
	s	″	s	″	s	″	s	″	s	″
Jan. 0.7	42.33 (.53)	24.9 (0.3)	70.36 (1.81)	48.3 (2.5)	55.58 (.29)	67.0 (2.0)	10.50 (.39)	28.5 (0.4)	54.99 (.32)	24.0 (1.3)
10.7	42.86 (.49)	25.2 (0.9)	72.17 (1.55)	50.8 (2.9)	55.87 (.27)	65.0 (1.8)	10.89 (.35)	28.1 (0.1)	55.31 (.28)	22.7 (1.0)
20.6	43.35 (.41)	26.1 (1.3)	73.72 (1.25)	53.7 (3.4)	56.14 (.22)	63.2 (1.5)	11.24 (.30)	28.2 (0.6)	55.59 (.25)	21.7 (0.7)
30.6	43.76 (.33)	27.4 (1.9)	74.97 (0.91)	57.1 (3.6)	56.36 (.19)	61.7 (1.3)	11.54 (.25)	28.8 (1.0)	55.84 (.21)	21.0 (0.3)
Feb. 9.6	44.09 (.24)	29.3 (2.2)	75.88 (0.57)	60.7 (3.8)	56.55 (.14)	60.4 (1.1)	11.79 (.18)	29.8 (1.4)	56.05 (.15)	20.7 (0.0)
19.5	44.33 (.15)	31.5 (2.5)	76.45 (0.25)	64.5 (3.9)	56.69 (.09)	59.3 (0.8)	11.97 (.12)	31.2 (1.7)	56.20 (.11)	20.7 (0.4)
Mar. 1.5	44.48 (.04)	34.0 (2.6)	76.70 (0.11)	68.4 (3.9)	56.78 (.04)	58.5 (0.5)	12.09 (.06)	32.9 (1.9)	56.31 (.06)	21.1 (0.6)
11.5	44.52 (.04)	36.6 (2.7)	76.59 (0.43)	72.3 (3.8)	56.82 (.01)	58.0 (0.3)	12.15 (.00)	34.8 (2.1)	56.37 (.01)	21.7 (0.8)
21.5	44.48 (.13)	39.3 (2.6)	76.16 (0.73)	76.1 (3.6)	56.83 (.03)	57.7 (0.0)	12.15 (.06)	36.9 (2.1)	56.38 (.03)	22.5 (1.0)
31.4	44.35 (.20)	41.9 (2.5)	75.43 (1.01)	79.7 (3.3)	56.80 (.06)	57.7 (0.1)	12.09 (.11)	39.0 (2.0)	56.35 (.06)	23.5 (1.1)
Apr. 10.4	44.15 (.26)	44.4 (2.2)	74.42 (1.25)	83.0 (3.1)	56.74 (.08)	57.8 (0.3)	11.98 (.14)	41.0 (2.0)	56.29 (.08)	24.6 (1.1)
20.4	43.89 (.31)	46.6 (1.9)	73.17 (1.48)	86.1 (2.6)	56.66 (.10)	58.1 (0.4)	11.84 (.17)	43.0 (1.7)	56.21 (.11)	25.7 (1.1)
30.4	43.58 (.34)	48.5 (1.5)	71.69 (1.65)	88.7 (2.2)	56.56 (.11)	58.5 (0.5)	11.67 (.19)	44.7 (1.4)	56.10 (.12)	26.8 (1.1)
May 10.3	43.24 (.35)	50.0 (1.0)	70.04 (1.79)	90.9 (1.8)	56.45 (.12)	59.0 (0.6)	11.48 (.21)	46.1 (1.2)	55.98 (.13)	27.9 (1.0)
20.3	42.89 (.36)	51.0 (0.6)	68.25 (1.90)	92.7 (1.2)	56.33 (.12)	59.6 (0.6)	11.27 (.20)	47.3 (0.8)	55.85 (.13)	28.9 (0.8)
30.3	42.53 (.35)	51.6 (0.1)	66.35 (1.95)	93.9 (0.6)	56.21 (.11)	60.2 (0.7)	11.07 (.20)	48.1 (0.4)	55.72 (.13)	29.7 (0.7)
June 9.2	42.18 (.34)	51.7 (0.4)	64.40 (1.95)	94.5 (0.2)	56.10 (.11)	60.9 (0.7)	10.87 (.19)	48.5 (0.1)	55.59 (.12)	30.4 (0.5)
19.2	41.84 (.30)	51.3 (0.9)	62.45 (1.90)	94.7 (0.5)	55.99 (.10)	61.6 (0.7)	10.68 (.18)	48.6 (0.3)	55.47 (.11)	30.9 (0.3)
29.2	41.54 (.27)	50.4 (1.3)	60.55 (1.81)	94.2 (1.0)	55.89 (.09)	62.3 (0.6)	10.50 (.15)	48.3 (0.7)	55.36 (.10)	31.2 (0.1)
July 9.2	41.27 (.23)	49.1 (1.7)	58.74 (1.66)	93.2 (1.5)	55.80 (.07)	62.9 (0.6)	10.35 (.13)	47.6 (1.0)	55.26 (.09)	31.3 (0.1)
19.1	41.04 (.19)	47.4 (2.1)	57.08 (1.45)	91.7 (1.9)	55.73 (.06)	63.5 (0.5)	10.22 (.10)	46.6 (1.4)	55.17 (.06)	31.2 (0.2)
29.1	40.85 (.13)	45.3 (2.5)	55.63 (1.20)	89.8 (2.4)	55.67 (.04)	64.0 (0.5)	10.12 (.07)	45.2 (1.7)	55.11 (.05)	31.0 (0.5)
Aug. 8.1	40.72 (.08)	42.8 (2.7)	54.43 (0.91)	87.4 (2.7)	55.63 (.01)	64.5 (0.3)	10.05 (.04)	43.5 (1.9)	55.06 (.02)	30.5 (0.7)
18.1	40.64 (.01)	40.1 (2.9)	53.52 (0.57)	84.7 (3.0)	55.62 (.01)	64.8 (0.2)	10.01 (.00)	41.6 (2.2)	55.04 (.00)	29.8 (0.9)
28.0	40.63 (.05)	37.2 (3.1)	52.95 (0.22)	81.7 (3.1)	55.63 (.03)	65.0 (0.0)	10.01 (.03)	39.4 (2.4)	55.04 (.03)	28.9 (1.1)
Sept. 7.0	40.68 (.11)	34.1 (3.3)	52.73 (0.17)	78.6 (3.2)	55.66 (.07)	65.0 (0.2)	10.04 (.08)	37.0 (2.5)	55.07 (.07)	27.8 (1.3)
17.0	40.79 (.18)	30.8 (3.3)	52.90 (0.56)	75.4 (3.0)	55.73 (.10)	64.8 (0.4)	10.12 (.13)	34.5 (2.7)	55.14 (.10)	26.5 (1.5)
26.9	40.97 (.24)	27.5 (3.2)	53.46 (0.93)	72.4 (2.9)	55.83 (.14)	64.4 (0.7)	10.25 (.17)	31.8 (2.8)	55.24 (.13)	25.0 (1.7)
Oct. 6.9	41.21 (.32)	24.3 (3.2)	54.39 (1.27)	69.5 (2.5)	55.97 (.17)	63.7 (0.9)	10.42 (.22)	29.0 (2.8)	55.37 (.18)	23.3 (1.9)
16.9	41.53 (.38)	21.1 (3.1)	55.66 (1.59)	67.0 (2.1)	56.14 (.21)	62.8 (1.2)	10.64 (.26)	26.2 (2.8)	55.55 (.21)	21.4 (2.0)
26.9	41.91 (.44)	18.0 (2.8)	57.25 (1.86)	64.9 (1.5)	56.35 (.25)	61.6 (1.5)	10.90 (.31)	23.4 (2.7)	55.76 (.25)	19.4 (2.2)
Nov. 5.8	42.35 (.50)	15.2 (2.5)	59.11 (2.06)	63.4 (1.0)	56.60 (.28)	60.1 (1.7)	11.21 (.35)	20.7 (2.5)	56.01 (.29)	17.2 (2.2)
15.8	42.85 (.54)	12.7 (2.1)	61.17 (2.17)	62.4 (0.4)	56.88 (.30)	58.4 (1.9)	11.56 (.39)	18.2 (2.3)	56.30 (.31)	15.0 (2.2)
25.8	43.39 (.57)	10.6 (1.7)	63.34 (2.23)	62.0 (0.3)	57.18 (.31)	56.5 (2.0)	11.95 (.40)	15.9 (2.0)	56.61 (.33)	12.8 (2.1)
Dec. 5.8	43.96 (.59)	8.9 (1.1)	65.57 (2.20)	62.3 (0.9)	57.49 (.32)	54.5 (2.1)	12.35 (.42)	13.9 (1.6)	56.94 (.34)	10.7 (2.0)
15.7	44.55 (.58)	7.8 (0.7)	67.77 (2.10)	63.2 (1.6)	57.81 (.32)	52.4 (2.0)	12.77 (.42)	12.3 (1.2)	57.28 (.34)	8.7 (1.8)
25.7	45.13 (.56)	7.1 (0.0)	69.87 (1.92)	64.8 (2.2)	58.13 (.31)	50.4 (2.0)	13.19 (.40)	11.1 (0.7)	57.62 (.33)	6.9 (1.5)
35.7	45.69	7.1	71.79	67.0	58.44	48 4	13.59	10.4	57.95	5.4

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	ν Ursæ Majoris. Right Ascension.	Declination North.	δ Crateris. Right Ascension.	Declination South.	τ Leonis. Right Ascension.	Declination North.	λ Draconis. Right Ascension.	Declination North.	ξ Hydræ. Right Ascension.	Declination South.
	h m	° '	h m	° '	h m	° '	h m	° '	h m	° '
	11 13	+33 37	11 14	--14 14	11 22	+ 3 23	11 25	+69 51	11 28	--31 18
	s	"	s	"	s	"	s	"	s	"
Jan. 0.7	12.28 (.35)	27.0 (0.9)	27.75 (.30)	56.0 (2.4)	55.00 (.30)	37.3 (1.9)	36.30 (.71)	54.7 (0.2)	12.30 (.33)	52.1 (2.6)
10.7	12.63 (.31)	26.1 (0.5)	28.05 (.27)	58.4 (2.4)	55.30 (.28)	35.4 (1.8)	37.01 (.66)	54.9 (0.8)	12.63 (.30)	54.7 (2.7)
20.7	12.94 (.28)	25.6 (0.1)	28.32 (.24)	60.8 (2.3)	55.58 (.24)	33.6 (1.6)	37.67 (.59)	55.7 (1.4)	12.93 (.27)	57.4 (2.9)
30.6	13.22 (.23)	25.5 (0.4)	28.56 (.19)	63.1 (2.2)	55.82 (.21)	32.0 (1.3)	38.26 (.48)	57.1 (1.9)	13.20 (.22)	60.3 (2.9)
Feb. 9.6	13.45 (.17)	25.9 (0.7)	28.75 (.15)	65.3 (1.9)	56.03 (.16)	30.7 (1.0)	38.74 (.37)	59.0 (2.3)	13.42 (.17)	63.1 (2.8)
19.6	13.62 (.12)	26.6 (1.1)	28.90 (.10)	67.2 (1.8)	56.19 (.11)	29.7 (0.7)	39.11 (.25)	61.3 (2.7)	13.59 (.12)	65.9 (2.6)
Mar. 1.5	13.74 (.06)	27.7 (1.3)	29.00 (.06)	69.0 (1.5)	56.30 (.07)	29.0 (0.5)	39.36 (.12)	64.0 (2.9)	13.71 (.07)	68.5 (2.5)
11.5	13.80 (.02)	29.0 (1.6)	29.06 (.02)	70.5 (1.3)	56.37 (.03)	28.5 (0.3)	39.48 (.00)	66.9 (2.9)	13.78 (.03)	71.0 (2.2)
21.5	13.82 (.03)	30.6 (1.6)	29.08 (.02)	71.8 (1.1)	56.40 (.01)	28.2 (0.0)	39.48 (.12)	69.8 (2.9)	13.81 (.01)	73.2 (2.0)
31.5	13.79 (.08)	32.2 (1.7)	29.06 (.05)	72.9 (0.8)	56.39 (.04)	28.2 (0.2)	39.36 (.22)	72.7 (2.8)	13.80 (.04)	75.2 (1.7)
Apr. 10.4	13.71 (.10)	33.9 (1.6)	29.01 (.07)	73.7 (0.5)	56.35 (.07)	28.4 (0.4)	39.14 (.32)	75.5 (2.5)	13.76 (.08)	76.9 (1.5)
20.4	13.61 (.13)	35.5 (1.5)	28.94 (.09)	74.2 (0.3)	56.28 (.08)	28.8 (0.5)	38.82 (.39)	78.0 (2.2)	13.68 (.10)	78.4 (1.1)
30.4	13.48 (.14)	37.0 (1.5)	28.85 (.11)	74.5 (0.1)	56.20 (.10)	29.3 (0.5)	38.43 (.45)	80.2 (2.2)	13.58 (.11)	79.5 (0.8)
May 10.4	13.34 (.16)	38.4 (1.4)	28.74 (.11)	74.6 (0.2)	56.10 (.11)	29.8 (0.5)	37.98 (.49)	82.0 (1.8)	13.47 (.13)	80.3 (0.5)
20.3	13.18 (.15)	39.5 (1.1)	28.63 (.12)	74.4 (0.3)	55.99 (.11)	30.4 (0.6)	37.49 (.51)	83.3 (1.3)	13.34 (.14)	80.8 (0.1)
30.3	13.03 (.16)	40.4 (0.9)	28.51 (.12)	74.1 (0.6)	55.88 (.11)	31.1 (0.7)	36.98 (.51)	84.1 (0.8)	13.20 (.15)	80.9 (0.2)
June 9.3	12.87 (.15)	41.1 (0.7)	28.39 (.12)	73.5 (0.6)	55.77 (.11)	31.8 (0.7)	36.47 (.51)	84.4 (0.3)	13.05 (.14)	80.7 (0.2)
19.2	12.72 (.14)	41.4 (0.3)	28.27 (.11)	72.8 (0.7)	55.66 (.10)	32.5 (0.7)	35.96 (.48)	84.2 (0.2)	12.91 (.14)	80.2 (0.5)
29.2	12.58 (.12)	41.5 (0.1)	28.16 (.10)	71.9 (0.7)	55.56 (.10)	33.2 (0.7)	35.48 (.44)	83.4 (0.8)	12.77 (.14)	79.4 (0.8)
July 9.2	12.46 (.11)	41.3 (0.2)	28.06 (.09)	71.0 (0.9)	55.46 (.08)	33.8 (0.6)	35.04 (.40)	82.2 (1.2)	12.63 (.13)	78.3 (1.1)
19.2	12.35 (.08)	40.7 (0.6)	27.97 (.07)	69.9 (0.9)	55.38 (.07)	34.4 (0.6)	34.64 (.34)	80.5 (1.7)	12.50 (.11)	77.0 (1.3)
29.1	12.27 (.06)	39.9 (0.8)	27.90 (.06)	68.7 (1.2)	55.31 (.06)	34.8 (0.4)	34.30 (.27)	78.3 (2.2)	12.39 (.09)	75.4 (1.6)
Aug. 8.1	12.21 (.04)	38.8 (1.1)	27.84 (.03)	67.5 (1.2)	55.25 (.03)	35.2 (0.4)	34.03 (.20)	75.8 (2.5)	12.30 (.06)	73.7 (1.7)
18.1	12.17 (.00)	37.5 (1.3)	27.81 (.01)	66.4 (1.1)	55.22 (.01)	35.5 (0.3)	33.83 (.13)	73.0 (2.8)	12.24 (.04)	71.9 (1.8)
28.1	12.17 (.03)	35.9 (1.6)	27.80 (.02)	65.3 (1.1)	55.21 (.01)	35.6 (0.1)	33.70 (.04)	69.9 (3.1)	12.20 (.00)	70.1 (1.8)
Sept. 7.0	12.20 (.06)	34.1 (1.8)	27.82 (.05)	64.3 (1.0)	55.22 (.05)	35.6 (0.0)	33.66 (.05)	66.5 (3.4)	12.20 (.04)	68.3 (1.8)
17.0	12.26 (.10)	32.1 (2.0)	27.87 (.09)	63.5 (0.8)	55.27 (.08)	35.3 (0.3)	33.71 (.14)	63.0 (3.5)	12.24 (.08)	66.6 (1.7)
27.0	12.36 (.14)	29.9 (2.2)	27.96 (.13)	63.0 (0.5)	55.35 (.12)	34.8 (0.5)	33.85 (.23)	59.5 (3.5)	12.32 (.12)	65.1 (1.5)
Oct. 6.9	12.50 (.18)	27.6 (2.3)	28.09 (.17)	62.7 (0.3)	55.47 (.16)	34.1 (0.7)	34.08 (.33)	55.9 (3.6)	12.44 (.17)	63.9 (1.2)
16.9	12.68 (.23)	25.1 (2.5)	28.26 (.21)	62.7 (0.0)	55.63 (.19)	33.1 (1.0)	34.41 (.42)	52.4 (3.5)	12.61 (.22)	63.0 (0.9)
26.9	12.91 (.27)	22.6 (2.5)	28.47 (.24)	63.1 (0.4)	55.82 (.23)	31.8 (1.3)	34.83 (.51)	49.1 (3.3)	12.83 (.26)	62.5 (0.5)
Nov. 5.9	13.18 (.30)	20.1 (2.5)	28.71 (.28)	63.9 (0.8)	56.05 (.27)	30.3 (1.5)	35.34 (.59)	46.0 (3.1)	13.09 (.30)	62.4 (0.1)
15.8	13.48 (.34)	17.7 (2.4)	28.99 (.31)	65.0 (1.1)	56.32 (.29)	28.6 (1.7)	35.93 (.65)	43.2 (2.8)	13.39 (.33)	62.8 (0.4)
25.8	13.82 (.35)	15.4 (2.3)	29.30 (.32)	66.4 (1.4)	56.61 (.32)	26.7 (1.9)	36.58 (.71)	40.8 (2.4)	13.72 (.35)	63.7 (0.9)
Dec. 5.8	14.17 (.37)	13.2 (2.2)	29.62 (.33)	68.2 (1.8)	56.93 (.32)	24.7 (2.0)	37.29 (.75)	38.9 (1.9)	14.07 (.36)	65.0 (1.3)
15.7	14.54 (.37)	11.4 (1.8)	29.95 (.32)	70.2 (2.0)	57.25 (.32)	22.6 (2.1)	38.04 (.75)	37.6 (1.3)	14.43 (.36)	66.7 (1.7)
25.7	14.91 (.36)	9.8 (1.6)	30.27 (.32)	72.4 (2.2)	57.57 (.32)	20.5 (2.1)	38.79 (.74)	36.8 (0.8)	14.79 (.35)	68.8 (2.1)
35.7	15.27	8.7 (1.1)	30.59	74.8 (2.4)	57.89	18.5 (2.0)	39.53	36.6 (0.2)	15.14	71.2 (2.4)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ν Leonis. Right Ascension.	ν Leonis. Declination South.	χ Ursæ Majoris. Right Ascension.	χ Ursæ Majoris. Declination North.	β Leonis. Right Ascension.	β Leonis. Declination North.	γ Ursæ Majoris Right Ascension.	γ Ursæ Majoris Declination North.	π Virginis. Right Ascension.	π Virginis. Declination North.
	h m $11\ 31$	° ' $-0\ 17$	h m $11\ 40$	° ' $+48\ 18$	h m $11\ 44$	° ' $+15\ 06$	h m $11\ 48$	° ' $+54\ 13$	h m $11\ 55$	° ' $+7\ 09$
	s	"	s	"	s	"	s	"	s	"
Jan. 0.7	56.98 (.30)	4.4 (2.0)	53.41 (.42)	61.0 (0.6)	4.63 (.32)	59.9 (1.7)	41.30 (.47)	60.6 (0.5)	51.97 (.32)	30.1 (2.0)
10.7	57.28 (.28)	6.4 (1.9)	53.83 (.39)	60.4 (0.1)	4.95 (.29)	58.2 (1.4)	41.77 (.44)	60.1 (0.0)	52.29 (.29)	28.1 (1.7)
20.7	57.56 (.25)	8.3 (1.8)	54.22 (.35)	60.3 (0.4)	5.24 (.27)	56.8 (1.1)	42.21 (.40)	60.1 (0.5)	52.58 (.27)	26.4 (1.4)
30.6	57.81 (.21)	10.1 (1.5)	54.57 (.30)	60.7 (0.9)	5.51 (.23)	55.7 (0.7)	42.61 (.34)	60.6 (1.1)	52.85 (.23)	25.0 (1.2)
Feb. 9.6	58.02 (.17)	11.6 (1.2)	54.87 (.24)	61.6 (1.3)	5.74 (.18)	55.0 (0.4)	42.95 (.28)	61.7 (1.6)	53.08 (.19)	23.8 (0.9)
19.6	58.19 (.12)	12.8 (1.0)	55.11 (.18)	62.9 (1.8)	5.92 (.14)	54.6 (0.1)	43.23 (.20)	63.3 (2.0)	53.27 (.15)	22.9 (0.5)
Mar. 1.6	58.31 (.08)	13.8 (0.7)	55.29 (.11)	64.7 (2.0)	6.06 (.09)	54.5 (0.2)	43.43 (.13)	65.3 (2.2)	53.42 (.10)	22.4 (0.3)
11.5	58.39 (.03)	14.5 (0.4)	55.40 (.04)	66.7 (2.3)	6.15 (.05)	54.7 (0.5)	43.56 (.06)	67.5 (2.5)	53.52 (.06)	22.1 (0.0)
21.5	58.42 (.00)	14.9 (0.2)	55.44 (.01)	69.0 (2.3)	6.20 (.01)	55.2 (0.7)	43.62 (.01)	70.0 (2.6)	53.58 (.03)	22.1 (0.3)
31.5	58.42 (.03)	15.1 (0.0)	55.43 (.07)	71.3 (2.3)	6.21 (.03)	55.9 (0.8)	43.61 (.07)	72.6 (2.6)	53.61 (.01)	22.4 (0.4)
Apr. 10.4	58.39 (.05)	15.1 (0.2)	55.36 (.12)	73.6 (2.3)	6.18 (.05)	56.7 (1.0)	43.54 (.13)	75.2 (2.4)	53.60 (.04)	22.8 (0.6)
20.4	58.34 (.08)	14.9 (0.3)	55.24 (.15)	75.9 (2.1)	6.13 (.08)	57.7 (1.0)	43.41 (.18)	77.6 (2.3)	53.56 (.06)	23.4 (0.7)
30.4	58.26 (.09)	14.6 (0.4)	55.09 (.19)	78.0 (1.8)	6.05 (.10)	58.7 (1.1)	43.23 (.21)	79.9 (1.9)	53.50 (.08)	24.1 (0.8)
May 10.4	58.17 (.10)	14.2 (0.5)	54.90 (.20)	79.8 (1.5)	5.95 (.10)	59.8 (1.0)	43.02 (.24)	81.8 (1.6)	53.42 (.09)	24.9 (0.8)
20.3	58.07 (.11)	13.7 (0.6)	54.70 (.21)	81.3 (1.2)	5.85 (.12)	60.8 (0.9)	42.78 (.25)	83.4 (1.3)	53.33 (.10)	25.7 (0.8)
30.3	57.96 (.11)	13.1 (0.7)	54.49 (.22)	82.5 (0.7)	5.73 (.12)	61.7 (0.8)	42.53 (.26)	84.7 (0.8)	53.23 (.11)	26.5 (0.8)
June 9.3	57.85 (.11)	12.4 (0.7)	54.27 (.22)	83.2 (0.4)	5.61 (.12)	62.5 (0.7)	42.27 (.26)	85.5 (0.3)	53.12 (.11)	27.3 (0.8)
19.3	57.74 (.11)	11.7 (0.7)	54.05 (.21)	83.6 (0.0)	5.50 (.11)	63.2 (0.7)	42.01 (.25)	85.8 (0.3)	53.01 (.11)	28.0 (0.7)
29.2	57.63 (.09)	11.0 (0.7)	53.84 (.19)	83.6 (0.5)	5.38 (.12)	63.7 (0.5)	41.76 (.24)	85.7 (0.1)	52.90 (.11)	28.7 (0.7)
July 9.2	57.54 (.09)	10.3 (0.7)	53.65 (.18)	83.1 (0.9)	5.27 (.11)	64.1 (0.4)	41.52 (.22)	85.2 (0.5)	52.79 (.11)	29.2 (0.5)
19.2	57.45 (.08)	9.6 (0.6)	53.47 (.15)	82.2 (1.2)	5.17 (.08)	64.4 (0.3)	41.30 (.20)	84.2 (1.0)	52.69 (.09)	29.7 (0.5)
29.1	57.37 (.06)	9.0 (0.6)	53.32 (.13)	81.0 (1.6)	5.09 (.08)	64.4 (0.0)	41.10 (.16)	82.8 (1.4)	52.60 (.08)	30.1 (0.4)
Aug. 8.1	57.31 (.04)	8.4 (0.4)	53.19 (.10)	79.4 (2.0)	5.01 (.05)	64.3 (0.1)	40.94 (.13)	81.0 (1.8)	52.52 (.06)	30.3 (0.2)
18.1	57.27 (.02)	8.0 (0.3)	53.09 (.06)	77.4 (2.2)	4.96 (.03)	64.0 (0.3)	40.81 (.09)	78.9 (2.1)	52.46 (.04)	30.4 (0.1)
28.1	57.25 (.00)	7.7 (0.2)	53.03 (.02)	75.2 (2.5)	4.93 (.01)	63.5 (0.5)	40.72 (.05)	76.4 (2.5)	52.42 (.02)	30.3 (0.1)
Sept. 7.0	57.25 (.04)	7.5 (0.1)	53.01 (.02)	72.7 (2.7)	4.92 (.03)	62.7 (0.8)	40.67 (.01)	73.7 (2.7)	52.40 (.02)	30.0 (0.3)
17.0	57.29 (.07)	7.6 (0.2)	53.03 (.07)	70.0 (2.9)	4.95 (.06)	61.7 (1.0)	40.68 (.06)	70.7 (3.0)	52.42 (.05)	29.5 (0.5)
27.0	57.36 (.11)	7.8 (0.6)	53.10 (.12)	67.1 (3.0)	5.01 (.09)	60.5 (1.2)	40.74 (.11)	67.6 (3.1)	52.47 (.08)	28.7 (0.8)
Oct. 7.0	57.47 (.15)	8.4 (0.8)	53.22 (.18)	64.1 (3.0)	5.10 (.14)	59.1 (1.4)	40.85 (.18)	64.3 (3.1)	52.55 (.13)	27.7 (1.0)
16.9	57.62 (.19)	9.2 (1.0)	53.40 (.22)	61.0 (3.1)	5.24 (.18)	57.5 (1.6)	41.03 (.23)	61.1 (3.2)	52.68 (.16)	26.5 (1.2)
26.9	57.81 (.23)	10.2 (1.4)	53.62 (.28)	57.9 (3.1)	5.42 (.22)	55.6 (1.9)	41.26 (.30)	57.8 (3.3)	52.84 (.21)	25.0 (1.5)
Nov. 5.9	58.04 (.26)	11.6 (1.6)	53.90 (.33)	54.9 (3.0)	5.64 (.25)	53.6 (2.0)	41.56 (.36)	54.6 (3.2)	53.05 (.24)	23.3 (1.7)
15.9	58.30 (.29)	13.2 (1.8)	54.23 (.38)	52.0 (2.9)	5.89 (.29)	51.5 (2.1)	41.92 (.40)	51.6 (3.0)	53.29 (.28)	21.4 (1.9)
25.8	58.59 (.31)	15.0 (1.9)	54.61 (.40)	49.4 (2.6)	6.18 (.31)	49.3 (2.2)	42.32 (.44)	48.9 (2.7)	53.57 (.30)	19.4 (2.0)
Dec. 5.8	58.90 (.32)	16.9 (2.1)	55.01 (.43)	47.1 (2.3)	6.49 (.32)	47.1 (2.2)	42.76 (.47)	46.6 (2.3)	53.87 (.32)	17.3 (2.1)
15.8	59.22 (.32)	19.0 (2.1)	55.44 (.44)	45.1 (2.0)	6.81 (.33)	44.9 (2.0)	43.23 (.48)	44.6 (2.0)	54.19 (.33)	15.1 (2.2)
25.7	59.54 (.32)	21.1 (2.1)	55.88 (.43)	43.6 (1.5)	7.14 (.33)	42.9 (2.0)	43.71 (.48)	43.2 (1.4)	54.52 (.32)	13.0 (2.1)
35.7	59.86	23.2	56.31	42.7 (0.9)	7.47	41.0 (1.9)	44.19	42.2 (1.0)	54.84	11.0 (2.0)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	υ Virginis. Right Ascension.	υ Virginis. Declination North.	ε Corvi. Right Ascension.	ε Corvi. Declination South.	4 Draconis. (H) Right Ascension.	4 Draconis. (H) Declination North.	γ Corvi. Right Ascension.	γ Corvi. Declination South.	2 Can.Ven. Right Ascension.	2 Can.Ven. Declination North.
	h m 12 00	° ′ +9 16	h m 12 05	° ′ −22 04	h m 12 07	° ′ +78 08	h m 12 10	° ′ −16 59	h m 12 11	° ′ +41 11
	s	″	s	″	s	″	s	″	s	″
Jan. 0.7	13.91 .32	28.8 1.9	6.14 .33	27.3 2.3	35.96 1.17	74.3 0.1	46.93 .33	51.6 2.2	13.57 .39	61.5 1.2
10.7	14.23 .30	26.9 1.6	6.47 .31	29.6 2.4	37.13 1.11	74.2 0.6	47.26 .31	53.8 2.2	13.96 .37	60.3 0.7
20.7	14.53 .27	25.3 1.4	6.78 .28	32.0 2.4	38.24 1.02	74.8 1.1	47.57 .28	56.0 2.3	14.33 .34	59.6 0.2
30.7	14.80 .24	23.9 1.1	7.06 .25	34.4 2.4	39.26 0.89	75.9 1.7	47.85 .24	58.3 2.2	14.67 .30	59.4 0.4
Feb. 9.6	15.04 .19	22.8 0.8	7.31 .20	36.8 2.3	40.15 0.74	77.6 2.3	48.09 .21	60.5 2.1	14.97 .25	59.8 0.8
19.6	15.23 .15	22.0 0.4	7.51 .16	39.1 2.1	40.89 0.55	79.9 2.6	48.30 .16	62.6 1.8	15.22 .20	60.6 1.3
Mar. 1.6	15.38 .11	21.6 0.1	7.67 .11	41.2 2.0	41.44 0.36	82.5 3.0	48.46 .12	64.4 1.7	15.42 .14	61.9 1.6
11.5	15.49 .06	21.5 0.1	7.78 .08	43.2 1.7	41.80 0.16	85.5 3.1	48.58 .08	66.1 1.5	15.56 .09	63.5 1.9
21.5	15.55 .03	21.6 0.4	7.86 .03	44.9 1.5	41.96 0.04	88.6 3.1	48.66 .04	67.6 1.2	15.65 .03	65.4 2.1
31.5	15.58 .00	22.0 0.5	7.89 .00	46.4 1.3	41.92 0.24	91.7 3.1	48.70 .01	68.8 1.0	15.68 .02	67.5 2.2
Apr. 10.5	15.58 .04	22.5 0.7	7.89 .03	47.7 1.0	41.68 0.42	94.8 2.8	48.71 .02	69.8 0.7	15.66 .06	69.7 2.2
20.4	15.54 .06	23.2 0.8	7.86 .05	48.7 0.8	41.26 0.57	97.6 2.6	48.69 .05	70.5 0.5	15.60 .10	71.9 2.1
30.4	15.48 .08	24.0 0.9	7.81 .07	49.5 0.5	40.69 0.69	100.2 2.2	48.64 .07	71.0 0.3	15.50 .12	74.0 1.9
May 10.4	15.40 .09	24.9 0.9	7.74 .10	50.0 0.3	40.00 0.80	102.4 1.7	48.57 .08	71.3 0.1	15.38 .15	75.9 1.7
20.4	15.31 .10	25.8 0.9	7.64 .10	50.3 0.1	39.20 0.88	104.1 1.3	48.49 .10	71.4 0.1	15.23 .17	77.6 1.5
30.3	15.21 .11	26.7 0.8	7.54 .12	50.4 0.2	38.32 0.92	105.4 0.7	48.39 .10	71.3 0.3	15.06 .17	79.1 1.1
June 9.3	15.10 .11	27.5 0.7	7.42 .12	50.2 0.4	37.40 0.93	106.1 0.1	48.29 .12	71.0 0.5	14.89 .18	80.2 0.7
19.3	14.99 .11	28.2 0.7	7.30 .12	49.8 0.7	36.47 0.93	106.2 0.4	48.17 .11	70.5 0.6	14.71 .18	80.9 0.4
29.2	14.88 .11	28.9 0.5	7.18 .12	49.1 0.8	35.54 0.90	105.8 1.0	48.06 .12	69.9 0.8	14.53 .18	81.3 0.0
July 9.2	14.77 .10	29.4 0.5	7.06 .12	48.3 1.0	34.64 0.84	104.8 1.4	47.94 .11	69.1 0.9	14.35 .16	81.3 0.4
19.2	14.67 .10	29.9 0.3	6.94 .11	47.3 1.2	33.80 0.77	103.4 2.0	47.83 .11	68.2 1.0	14.19 .15	80.9 0.8
29.2	14.57 .08	30.2 0.1	6.83 .10	46.1 1.2	33.03 0.68	101.4 2.4	47.72 .10	67.2 1.1	14.04 .14	80.1 1.1
Aug. 8.1	14.49 .06	30.3 0.0	6.73 .09	44.9 1.3	32.35 0.57	99.0 2.7	47.62 .08	66.1 1.1	13.90 .11	79.0 1.5
18.1	14.43 .05	30.3 0.2	6.64 .06	43.6 1.4	31.78 0.45	96.3 3.2	47.54 .06	65.0 1.1	13.79 .09	77.5 1.8
28.1	14.38 .02	30.1 0.4	6.58 .03	42.2 1.3	31.33 0.32	93.1 3.3	47.48 .04	63.9 1.1	13.70 .05	75.7 2.0
Sept. 7.1	14.36 .01	29.7 0.6	6.55 .00	40.9 1.2	31.01 0.18	89.8 3.6	47.44 .00	62.8 0.9	13.65 .02	73.7 2.4
17.0	14.37 .04	29.1 0.9	6.55 .04	39.7 1.0	30.83 0.02	86.2 3.7	47.44 .03	61.9 0.7	13.63 .03	71.3 2.6
27.0	14.41 .08	28.2 1.1	6.59 .08	38.7 0.8	30.81 0.13	82.5 3.8	47.47 .07	61.2 0.5	13.66 .07	68.7 2.7
Oct. 7.0	14.49 .12	27.1 1.3	6.67 .13	37.9 0.5	30.94 0.30	78.7 3.8	47.54 .12	60.7 0.2	13.73 .12	66.0 2.9
16.9	14.61 .17	25.8 1.5	6.80 .17	37.4 0.2	31.24 0.46	74.9 3.6	47.66 .16	60.5 0.1	13.85 .17	63.1 3.0
26.9	14.78 .20	24.3 1.8	6.97 .22	37.2 0.2	31.70 0.62	71.3 3.4	47.82 .21	60.6 0.4	14.02 .22	60.1 3.0
Nov. 5.9	14.98 .24	22.5 1.9	7.19 .26	37.4 0.6	32.32 0.77	67.9 3.1	48.03 .25	61.0 0.8	14.24 .27	57.1 3.0
15.9	15.22 .27	20.6 2.1	7.45 .29	38.0 1.0	33.09 0.91	64.8 2.8	48.28 .28	61.8 1.1	14.51 .31	54.1 3.0
25.8	15.49 .30	18.5 2.2	7.74 .32	39.0 1.3	34.00 1.02	62.0 2.3	48.56 .31	62.9 1.5	14.82 .35	51.3 2.8
Dec. 5.8	15.79 .32	16.3 2.2	8.06 .34	40.3 1.7	35.02 1.10	59.7 1.7	48.87 .33	64.4 1.8	15.17 .38	48.7 2.6
15.8	16.11 .33	14.1 2.1	8.40 .34	42.0 1.9	36.12 1.16	58.0 1.2	49.20 .33	66.2 2.0	15.55 .39	46.4 2.3
25.8	16.44 .32	12.0 2.0	8.74 .34	43.9 2.2	37.28 1.18	56.8 0.5	49.53 .33	68.2 2.1	15.94 .40	44.5 1.9
35.7	16.76	10.0	9.08	46.1	38.46	56.3	49.86	70.3	16.34	43.0 1.5

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Chamæleontis. Right Ascension.	β Chamæleontis. Declination South.	6(B)Ursæ Minoris. Right Ascension.	6(B)Ursæ Minoris. Declination North.	η Virginis. Right Ascension.	η Virginis. Declination South.	a¹ Crucis. Right Ascension.	a¹ Crucis. Declination South.	δ² Corvi. Right Ascension.	δ² Corvi. Declination South.
	h m / 12 12	° ' / −78 45	h m / 12 13	° ' / +88 13	h m / 12 14	° ' / − 0 07	h m / 12 21	° ' / −62 33	h m / 12 24	° ' / −15 58
	s	"	s	"	s	"	s	"	s	"
Jan. 0.7	39.36 (1.21)	49.7 (1.7)	71.7 (7.2)	70.7 (0.1)	54.39 (.32)	25.5 (2.0)	10.51 (.58)	8.1 (1.9)	48.51 (.33)	11.0 (2.2)
10.7	40.57 (1.13)	51.4 (2.2)	78.9 (6.9)	70.8 (0.7)	54.71 (.30)	27.5 (2.0)	11.09 (.54)	10.0 (2.3)	48.84 (.31)	13.2 (2.2)
20.7	41.70 (1.01)	53.6 (2.7)	85.8 (6.4)	71.5 (1.3)	55.01 (.27)	29.5 (1.7)	11.63 (.50)	12.3 (2.8)	49.15 (.29)	15.4 (2.2)
30.7	42.71 (0.88)	56.3 (3.1)	92.2 (5.7)	72.8 (1.9)	55.28 (.25)	31.2 (1.5)	12.13 (.43)	15.1 (3.0)	49.44 (.25)	17.6 (2.1)
Feb. 9.6	43.59 (0.72)	59.4 (3.4)	97.9 (4.7)	74.7 (2.3)	55.53 (.20)	32.7 (1.3)	12.56 (.36)	18.1 (3.3)	49.69 (.22)	19.7 (2.0)
19.6	44.31 (0.56)	62.8 (3.6)	102.6 (3.6)	77.0 (2.8)	55.73 (.16)	34.0 (1.0)	12.92 (.29)	21.4 (3.4)	49.91 (.18)	21.7 (1.8)
Mar. 1.6	44.87 (0.38)	66.4 (3.8)	106.2 (2.3)	79.8 (3.0)	55.89 (.12)	35.0 (0.7)	13.21 (.21)	24.8 (3.5)	50.09 (.13)	23.5 (1.6)
11.5	45.25 (0.22)	70.2 (3.8)	108.5 (1.0)	82.8 (3.2)	56.01 (.08)	35.7 (0.4)	13.42 (.14)	28.3 (3.5)	50.22 (.09)	25.1 (1.4)
21.5	45.47 (0.04)	74.0 (3.7)	109.5 (0.4)	86.0 (3.2)	56.09 (.05)	36.1 (0.2)	13.56 (.07)	31.8 (3.4)	50.31 (.06)	26.5 (1.2)
31.5	45.51 (0.12)	77.7 (3.6)	109.1 (1.7)	89.2 (3.1)	56.14 (.01)	36.3 (0.0)	13.63 (.00)	35.2 (3.2)	50.37 (.02)	27.7 (0.9)
Apr. 10.5	45.39 (0.27)	81.3 (3.4)	107.4 (2.9)	92.3 (2.9)	56.15 (.02)	36.3 (0.2)	13.63 (.07)	38.4 (3.0)	50.39 (.01)	28.6 (0.7)
20.4	45.12 (0.42)	84.7 (3.2)	104.5 (4.0)	95.2 (2.5)	56.13 (.04)	36.1 (0.4)	13.56 (.13)	41.4 (2.7)	50.38 (.03)	29.3 (0.5)
30.4	44.70 (0.55)	87.9 (2.8)	100.5 (5.0)	97.7 (2.2)	56.09 (.06)	35.7 (0.5)	13.43 (.17)	44.1 (2.4)	50.35 (.05)	29.8 (0.3)
May 10.4	44.15 (0.67)	90.7 (2.4)	95.5 (5.7)	99.9 (1.6)	56.03 (.08)	35.2 (0.6)	13.26 (.23)	46.5 (2.0)	50.30 (.07)	30.1 (0.0)
20.4	43.48 (0.77)	93.1 (1.9)	89.8 (6.3)	101.5 (1.2)	55.95 (.09)	34.6 (0.6)	13.03 (.26)	48.5 (1.5)	50.23 (.09)	30.1 (0.1)
30.3	42.71 (0.85)	95.0 (1.5)	83.5 (6.7)	102.7 (0.6)	55.86 (.10)	34.0 (0.7)	12.77 (.30)	50.0 (1.1)	50.14 (.10)	30.0 (0.3)
June 9.3	41.86 (0.91)	96.5 (1.0)	76.8 (6.9)	103.3 (0.0)	55.76 (.11)	33.3 (0.7)	12.47 (.32)	51.1 (0.7)	50.04 (.11)	29.7 (0.4)
19.3	40.95 (0.94)	97.5 (0.4)	69.9 (6.8)	103.3 (0.6)	55.65 (.10)	32.6 (0.7)	12.15 (.34)	51.8 (0.1)	49.93 (.12)	29.3 (0.6)
29.2	40.01 (0.95)	97.9 (0.2)	63.1 (6.6)	102.7 (1.1)	55.55 (.11)	31.9 (0.7)	11.81 (.34)	51.9 (0.4)	49.81 (.11)	28.7 (0.6)
July 9.2	39.06 (0.94)	97.7 (0.7)	56.5 (6.3)	101.6 (1.6)	55.44 (.11)	31.2 (0.6)	11.47 (.35)	51.5 (0.8)	49.70 (.12)	27.9 (0.8)
19.2	38.12 (0.89)	97.0 (1.2)	50.2 (5.8)	100.0 (2.1)	55.33 (.10)	30.6 (0.6)	11.12 (.33)	50.7 (1.3)	49.58 (.11)	27.1 (1.0)
29.2	37.23 (0.81)	95.8 (1.7)	44.4 (5.1)	97.9 (2.6)	55.23 (.09)	30.0 (0.5)	10.79 (.30)	49.4 (1.7)	49.47 (.11)	26.1 (1.0)
Aug. 8.1	36.42 (0.71)	94.1 (2.2)	39.3 (4.4)	95.3 (2.9)	55.14 (.07)	29.5 (0.4)	10.49 (.27)	47.7 (2.1)	49.36 (.09)	25.1 (1.0)
18.1	35.71 (0.57)	91.9 (2.5)	34.9 (3.6)	92.4 (3.2)	55.07 (.06)	29.1 (0.3)	10.22 (.22)	45.6 (2.4)	49.27 (.07)	24.1 (1.0)
28.1	35.14 (0.40)	89.4 (2.9)	31.3 (2.6)	89.2 (3.5)	55.01 (.03)	28.8 (0.2)	10.00 (.15)	43.2 (2.6)	49.20 (.05)	23.1 (0.9)
Sept. 7.1	34.74 (0.22)	86.5 (3.0)	28.7 (1.7)	85.7 (3.7)	54.98 (.01)	28.6 (0.1)	9.85 (.08)	40.6 (2.7)	49.15 (.01)	22.2 (0.8)
17.0	34.52 (0.03)	83.5 (3.1)	27.0 (0.7)	82.0 (3.8)	54.97 (.03)	28.7 (0.1)	9.77 (.00)	37.9 (2.8)	49.14 (.01)	21.4 (0.7)
27.0	34.49 (0.19)	80.4 (3.0)	26.3 (0.4)	78.2 (3.8)	55.00 (.07)	29.0 (0.3)	9.77 (.09)	35.1 (2.7)	49.15 (.06)	20.7 (0.5)
Oct. 7.0	34.68 (0.39)	77.4 (2.9)	26.7 (1.5)	74.4 (3.7)	55.07 (.10)	29.5 (0.5)	9.86 (.18)	32.4 (2.5)	49.21 (.10)	20.2 (0.1)
16.9	35.07 (0.61)	74.5 (2.6)	28.2 (2.5)	70.7 (3.6)	55.17 (.15)	30.3 (0.8)	10.04 (.27)	29.9 (2.2)	49.31 (.15)	20.1 (0.1)
26.9	35.68 (0.79)	71.9 (2.3)	30.7 (3.5)	67.1 (3.4)	55.32 (.20)	31.3 (1.0)	10.31 (.35)	27.7 (1.8)	49.46 (.19)	20.2 (0.4)
Nov. 5.9	36.47 (0.95)	69.6 (1.7)	34.2 (4.5)	63.7 (3.1)	55.52 (.23)	32.6 (1.3)	10.66 (.44)	25.9 (1.3)	49.65 (.24)	20.6 (0.8)
15.9	37.42 (1.09)	67.9 (1.2)	38.7 (5.3)	60.6 (2.6)	55.75 (.26)	34.2 (1.6)	11.10 (.50)	24.6 (0.8)	49.89 (.27)	21.4 (1.1)
25.8	38.51 (1.19)	66.7 (0.6)	44.0 (6.1)	58.0 (2.2)	56.01 (.30)	36.0 (1.8)	11.60 (.55)	23.8 (0.2)	50.16 (.30)	22.5 (1.5)
Dec. 5.8	39.70 (1.25)	66.1 (0.0)	50.1 (6.7)	55.8 (1.6)	56.31 (.31)	37.9 (1.9)	12.15 (.58)	23.6 (0.4)	50.46 (.33)	24.0 (1.7)
15.8	40.95 (1.26)	66.1 (0.7)	56.8 (7.1)	54.2 (1.0)	56.62 (.32)	40.0 (2.1)	12.73 (.59)	24.0 (1.0)	50.79 (.33)	25.7 (1.9)
25.8	42.21 (1.24)	66.8 (1.3)	63.9 (7.2)	53.2 (0.4)	56.94 (.33)	42.1 (2.1)	13.32 (.59)	25.0 (1.6)	51.12 (.33)	27.6 (2.1)
35.7	43.45	68.1	71.1	52.8	57.27	44.2	13.91	26.6	51.45	29.7

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	β Can. Ven. Right Ascension (h m 12 29)	β Can. Ven. Declination North (+41 52)	β Corvi Right Ascension (h m 12 29)	β Corvi Declination South (−22 51)	κ Draconis Right Ascension (h m 12 29)	κ Draconis Declination North (+70 19)	γ Virginis (mean) Right Ascension (h m 12 36)	γ Virginis (mean) Declination South (− 0 54)	31 Com. Berenices Right Ascension (h m 12 46)	31 Com. Berenices Declination North (+28 03)
Jan. 0.7	5.78 .39	65.4 1.3	15.24 .34	14.4 2.2	17.57 .75	18.9 0.7	42.44 .32	47.5 2.1	55.90 .35	72.2 1.7
10.7	6.17 .38	64.1 0.8	15.58 .33	16.6 2.3	18.32 .72	18.2 0.0	42.76 .31	49.6 1.9	56.25 .34	70.5 1.4
20.7	6.55 .35	63.3 0.3	15.91 .30	18.9 2.3	19.04 .68	18.2 0.7	43.07 .28	51.5 1.8	56.59 .32	69.1 0.9
30.7	6.90 .32	63.0 0.2	16.21 .26	21.2 2.3	19.72 .61	18.9 1.3	43.35 .25	53.3 1.5	56.91 .29	68.2 0.4
Feb. 9.6	7.22 .27	63.2 0.8	16.47 .23	23.5 2.3	20.33 .52	20.2 1.8	43.60 .22	54.8 1.3	57.20 .25	67.8 0.0
19.6	7.49 .21	64.0 1.2	16.70 .18	25.8 2.1	20.85 .42	22.0 2.3	43.82 .18	56.1 1.0	57.45 .21	67.8 0.5
Mar. 1.6	7.70 .17	65.2 1.6	16.88 .14	27.9 2.0	21.27 .29	24.3 2.7	44.00 .14	57.1 0.8	57.66 .16	68.3 0.8
11.6	7.87 .10	66.8 2.0	17.02 .10	29.9 1.7	21.56 .18	27.0 2.9	44.14 .10	57.9 0.5	57.82 .12	69.1 1.2
21.5	7.97 .05	68.8 2.1	17.12 .07	31.6 1.6	21.74 .05	29.9 3.0	44.24 .07	58.4 0.2	57.94 .08	70.3 1.5
31.5	8.02 .01	70.9 2.3	17.19 .02	33.2 1.3	21.79 .07	32.9 3.1	44.31 .03	58.6 0.0	58.02 .03	71.8 1.6
Apr. 10.5	8.03 .05	73.2 2.3	17.21 .00	34.5 1.1	21.72 .17	36.0 2.9	44.34 .00	58.6 0.2	58.05 .00	73.4 1.8
20.4	7.98 .08	75.5 2.2	17.21 .03	35.6 0.8	21.55 .27	38.9 2.8	44.34 .02	58.4 0.3	58.05 .04	75.2 1.8
30.4	7.90 .11	77.7 2.1	17.18 .05	36.4 0.7	21.28 .36	41.7 2.4	44.32 .04	58.1 0.5	58.01 .06	77.0 1.7
May 10.4	7.79 .14	79.8 1.8	17.13 .08	37.1 0.3	20.92 .42	44.1 2.0	44.28 .06	57.6 0.5	57.95 .09	78.7 1.7
20.4	7.65 .16	81.6 1.6	17.05 .09	37.4 0.2	20.50 .47	46.1 1.6	44.22 .08	57.0 0.6	57.86 .10	80.4 1.5
30.3	7.49 .18	83.2 1.3	16.96 .10	37.6 0.1	20.03 .51	47.7 1.1	44.14 .09	56.4 0.7	57.76 .12	81.9 1.3
June 9.3	7.31 .18	84.5 0.9	16.86 .12	37.5 0.3	19.52 .53	48.8 0.6	44.05 .10	55.7 0.7	57.64 .13	83.2 1.1
19.3	7.13 .19	85.4 0.6	16.74 .12	37.2 0.3	18.99 .54	49.4 0.1	43.95 .11	55.0 0.7	57.51 .14	84.3 0.8
29.3	6.94 .18	86.0 0.1	16.62 .12	36.7 0.5	18.45 .53	49.5 0.5	43.84 .12	54.3 0.7	57.37 .14	85.1 0.5
July 9.2	6.76 .18	86.1 0.2	16.50 .13	36.0 0.7	17.92 .51	49.0 1.0	43.72 .11	53.6 0.7	57.23 .15	85.6 0.2
19.2	6.58 .17	85.9 0.6	16.37 .12	35.1 1.0	17.41 .47	48.0 1.5	43.61 .11	52.9 0.6	57.08 .14	85.8 0.1
29.2	6.41 .16	85.3 1.1	16.25 .12	34.1 1.2	16.94 .43	46.5 2.0	43.50 .10	52.3 0.5	56.94 .13	85.7 0.4
Aug. 8.1	6.25 .13	84.2 1.3	16.13 .10	32.9 1.2	16.51 .38	44.5 2.3	43.40 .10	51.8 0.5	56.81 .11	85.3 0.7
18.1	6.12 .11	82.9 1.8	16.03 .08	31.7 1.3	16.13 .31	42.2 2.8	43.30 .08	51.3 0.3	56.70 .10	84.6 1.1
28.1	6.01 .08	81.1 2.0	15.95 .06	30.4 1.3	15.82 .24	39.4 3.1	43.22 .05	51.0 0.1	56.60 .08	83.5 1.3
Sept. 7.1	5.93 .05	79.1 2.3	15.89 .02	29.1 1.2	15.58 .16	36.3 3.3	43.17 .03	50.9 0.0	56.52 .05	82.2 1.6
17.0	5.88 .00	76.8 2.6	15.87 .01	27.9 1.0	15.42 .06	33.0 3.6	43.14 .01	50.9 0.2	56.47 .01	80.6 1.9
27.0	5.88 .04	74.2 2.8	15.88 .06	26.9 0.9	15.36 .03	29.4 3.7	43.15 .04	51.1 0.5	56.46 .02	78.7 2.1
Oct. 7.0	5.92 .09	71.4 3.0	15.94 .10	26.0 0.6	15.39 .13	25.7 3.7	43.19 .09	51.6 0.7	56.48 .07	76.6 2.3
17.0	6.01 .15	68.4 3.0	16.04 .15	25.4 0.3	15.52 .24	22.0 3.7	43.28 .13	52.3 0.9	56.55 .12	74.3 2.6
26.9	6.16 .20	65.4 3.1	16.19 .20	25.1 0.1	15.76 .34	18.3 3.5	43.41 .17	53.2 1.3	56.67 .17	71.7 2.6
Nov. 5.9	6.36 .25	62.3 3.1	16.39 .24	25.2 0.4	16.10 .45	14.8 3.4	43.58 .22	54.5 1.5	56.84 .21	69.1 2.8
15.9	6.61 .30	59.2 2.9	16.63 .28	25.6 0.8	16.55 .54	11.4 3.1	43.80 .25	56.0 1.7	57.05 .25	66.3 2.7
25.8	6.91 .33	56.3 2.7	16.91 .31	26.4 1.2	17.09 .62	8.3 2.6	44.05 .29	57.7 1.9	57.30 .29	63.6 2.7
Dec. 5.8	7.24 .37	53.6 2.5	17.22 .33	27.6 1.5	17.71 .68	5.7 2.2	44.34 .31	59.6 2.0	57.59 .33	60.9 2.5
15.8	7.61 .39	51.1 2.0	17.55 .35	29.1 1.8	18.39 .73	3.5 1.6	44.65 .32	61.6 2.1	57.92 .34	58.4 2.2
25.8	8.00 .40	49.1 1.6	17.90 .34	30.9 2.0	19.12 .75	1.9 1.0	44.97 .32	63.7 2.1	58.26 .35	56.2 2.0
35.7	8.40	47.5	18.24	32.9	19.87	0.9	45.29	65.8	58.61	54.2

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	32² Camelop. (H.) Right Ascension	Declination North.	α Can. Ven. Right Ascension	Declination North.	δ Muscæ. Right Ascension	Declination South.	ε Virginis. Right Ascension	Declination North.	θ Virginis. Right Ascension	Declination South.
	h m 12 48	+83 56	h m 12 51	+38 50	h m 12 55	−71 00	h m 12 57	+11 28	h m 13 04	− 5 00
	s	"	s	"	s	° '	s	° '	s	° '
Jan. 0.8	18.83 (2.15)	20.8 (0.6)	26.85 (.38)	34.5 (1.6)	33.32 (.81)	56.9 (1.3)	18.40 (.33)	60.8 (2.0)	53.11 (.33)	59.2 (2.0)
10.7	20.98 (2.13)	20.2 (0.1)	27.23 (.37)	32.9 (1.1)	34.13 (.78)	58.2 (1.8)	18.73 (.32)	58.8 (1.7)	53.44 (.31)	61.2 (2.0)
20.7	23.11 (2.03)	20.3 (0.8)	27.60 (.36)	31.8 (0.6)	34.91 (.73)	60.0 (2.3)	19.05 (.30)	57.1 (1.5)	53.75 (.30)	63.2 (1.8)
30.7	25.14 (1.87)	21.1 (1.4)	27.96 (.32)	31.2 (0.1)	35.64 (.66)	62.3 (2.7)	19.35 (.27)	55.6 (1.1)	54.05 (.28)	65.0 (1.7)
Feb. 9.7	27.01 (1.62)	22.5 (2.0)	28.28 (.28)	31.1 (0.5)	36.30 (.58)	65.0 (3.0)	19.62 (.24)	54.5 (0.8)	54.33 (.24)	66.7 (1.5)
19.6	28.63 (1.33)	24.5 (2.4)	28.56 (.23)	31.6 (1.0)	36.88 (.49)	68.0 (3.3)	19.86 (.20)	53.7 (0.4)	54.57 (.20)	68.2 (1.2)
Mar. 1.6	29.96 (0.98)	26.9 (2.8)	28.79 (.18)	32.6 (1.4)	37.37 (.39)	71.3 (3.4)	20 06 (.16)	53.3 (0.0)	54.77 (.17)	69.4 (0.9)
11.6	30.94 (0.61)	29.7 (3.1)	28.97 (.13)	34.0 (1.7)	37.76 (.29)	74.7 (3.5)	20.22 (.13)	53.3 (0.2)	54.94 (.13)	70.3 (0.8)
21.5	31.55 (0.23)	32.8 (3.1)	29.10 (.08)	35.7 (2.0)	38.05 (.20)	78.2 (3.6)	20.35 (.08)	53.5 (0.5)	55.07 (.10)	71.1 (0.4)
31.5	31.78 (0.16)	35.9 (3.2)	29.18 (.04)	37.7 (2.1)	38.25 (.09)	81.8 (3.5)	20.43 (.05)	54.0 (0.8)	55.17 (.06)	71.5 (0.2)
Apr. 10.5	31.62 (0.54)	39.1 (3.1)	29.22 (.01)	39.8 (2.3)	38.34 (.00)	85.3 (3.3)	20.48 (.02)	54.8 (0.9)	55.23 (.03)	71.7 (0.1)
20.5	31.08 (0.87)	42.2 (2.9)	29.21 (.05)	42.1 (2.2)	38.34 (.09)	88.6 (3.1)	20.50 (.01)	55.7 (1.1)	55.26 (.00)	71.8 (0.2)
30.4	30.21 (1.18)	45.1 (2.5)	29.16 (.08)	44.3 (2.1)	38.25 (.18)	91.7 (2.9)	20.49 (.04)	56.8 (1.1)	55.26 (.02)	71.6 (0.3)
May 10.4	29.03 (1.44)	47.6 (2.1)	29.08 (.11)	46.4 (2.0)	38.07 (.26)	94.6 (2.5)	20.45 (.05)	57.9 (1.1)	55.24 (.04)	71.3 (0.4)
20.4	27.59 (1.64)	49.7 (1.6)	28.97 (.14)	48.4 (1.7)	37.81 (.33)	97.1 (2.1)	20.40 (.08)	59.0 (1.1)	55.20 (.06)	70.9 (0.5)
30.4	25.95 (1.80)	51.3 (1.1)	28.83 (.15)	50.1 (1.5)	37.48 (.40)	99.2 (1.8)	20.32 (.09)	60.1 (1.1)	55.14 (.08)	70.4 (0.6)
June 9.3	24.15 (1.90)	52.4 (0.6)	28.68 (.16)	51.6 (1.1)	37.08 (.44)	101.0 (1.2)	20.23 (.10)	61.2 (0.9)	55.06 (.09)	69.8 (0.6)
19.3	22.25 (1.94)	53.0 (0.0)	28.52 (.17)	52.7 (0.8)	36.64 (.49)	102.2 (0.8)	20.13 (.11)	62.1 (0.8)	54.97 (.10)	69.2 (0.7)
29.3	20.31 (1.95)	53.0 (0.5)	28.35 (.18)	53.5 (0.4)	36.15 (.52)	103.0 (0.2)	20.02 (.12)	62.9 (0.7)	54.87 (.11)	68.5 (0.7)
July 9.2	18.36 (1.89)	52.5 (1.1)	28.17 (.18)	53.9 (0.0)	35.63 (.53)	103.2 (0.3)	19.90 (.12)	63.6 (0.6)	54.76 (.11)	67.8 (0.7)
19.2	16.47 (1.80)	51.4 (1.6)	27.99 (.17)	53.9 (0.3)	35.10 (.52)	102.9 (0.8)	19.78 (.12)	64.2 (0.3)	54.65 (.12)	67.1 (0.6)
29.2	14.67 (1.66)	49.8 (2.1)	27.82 (.16)	53.6 (0.8)	34.58 (.51)	102.1 (1.3)	19.66 (.11)	64.5 (0.2)	54.53 (.12)	66.5 (0.6)
Aug. 8.2	13.01 (1.50)	47.7 (2.5)	27.66 (.15)	52.8 (1.1)	34.07 (.46)	100.8 (1.7)	19.55 (.11)	64.7 (0.0)	54.41 (.11)	65.9 (0.6)
18.1	11.51 (1.29)	45.2 (2.9)	27.51 (.12)	51.7 (1.5)	33.61 (.40)	99.1 (2.2)	19.44 (.09)	64.7 (0.3)	54.30 (.09)	65.3 (0.6)
28.1	10.22 (1.06)	42.3 (3.2)	27.39 (.10)	50.2 (1.8)	33.21 (.32)	96.9 (2.5)	19.35 (.08)	64.4 (0.4)	54.21 (.08)	64.8 (0.3)
Sept. 7.1	9.16 (0.79)	39.1 (3.5)	27.29 (.07)	48.4 (2.1)	32.89 (.23)	94.4 (2.7)	19.27 (.05)	64.0 (0.7)	54.13 (.05)	64.5 (0.2)
17.1	8.37 (0.51)	35.6 (3.6)	27.22 (.03)	46.3 (2.4)	32.66 (.11)	91.7 (2.9)	19.22 (.01)	63.3 (1.0)	54.08 (.02)	64.3 (0.1)
27.0	7.86 (0.22)	32.0 (3.8)	27.19 (.01)	43.9 (2.6)	32.55 (.01)	88.8 (2.9)	19.21 (.02)	62.3 (1.2)	54.06 (.02)	64.2 (0.2)
Oct. 7.0	7.64 (0.10)	28.2 (3.8)	27.20 (.06)	41.3 (2.9)	32.56 (.14)	85.9 (2.9)	19.23 (.06)	61.1 (1.4)	54.08 (.06)	64.4 (0.5)
17.0	7.74 (0.43)	24.4 (3.8)	27.26 (.12)	38.4 (3.0)	32.70 (.27)	83.0 (2.7)	19.29 (.11)	59.7 (1.7)	54.14 (.10)	64.9 (0.7)
26.9	8.17 (0.76)	20.6 (3.6)	27.38 (.16)	35.4 (3.0)	32.97 (.40)	80.3 (2.3)	19.40 (.15)	58.0 (1.8)	54.24 (.15)	65.6 (0.9)
Nov. 5.9	8.93 (1.07)	17.0 (3.4)	27.54 (.22)	32.4 (3.1)	33.37 (.51)	78.0 (2.0)	19.55 (.19)	56.2 (2.1)	54.39 (.19)	66.5 (1.3)
15.9	10.00 (1.36)	13.6 (3.1)	27.76 (.27)	29.3 (3.0)	33.88 (.62)	76.0 (1.4)	19.74 (.24)	54.1 (2.2)	54.58 (.24)	67.8 (1.4)
25.9	11.36 (1.64)	10.5 (2.6)	28.03 (.31)	26.3 (2.9)	34.50 (.71)	74.6 (0.9)	19.98 (.27)	51.9 (2.3)	54.82 (.27)	69.2 (1.7)
Dec. 5.8	13.00 (1.85)	7.9 (2.1)	28.34 (.35)	23.4 (2.6)	35.21 (.77)	73.7 (0.4)	20.25 (.30)	49.6 (2.3)	55.09 (.29)	70.9 (1.9)
15.8	14.85 (2.03)	5.8 (1.6)	28.69 (.37)	20.8 (2.3)	35.98 (.80)	73.3 (0.3)	20.55 (.31)	47.3 (2.2)	55.38 (.32)	72.8 (2.0)
25.8	16.88 (2.13)	4.2 (1.0)	29.06 (.38)	18.5 (1.9)	36.78 (.81)	73.6 (0.9)	20.86 (.33)	45.1 (2.1)	55.70 (.33)	74.8 (2.0)
35.8	19.01	3.2	29.44	16.6	37.59	74.5	21.19	43.0	56.03	76.8

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	20 Can. Ven. Right Ascension.	20 Can. Ven. Declination North.	α Virginis. (Spica.) Right Ascension.	α Virginis. (Spica.) Declination South.	κ Octantis. Right Ascension.	κ Octantis. Declination South.	ζ Virginis. Right Ascension.	ζ Virginis. Declination South.	B. A. C. 4536. Right Ascension.	B. A. C. 4536. Declination North.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	13 13	+41 04	13 20	−10 38	13 24	−85 16	13 29	− 0 05	13 30	+37 40
	s	″	s	″	s	″	s	″	s	″
Jan. 0.8	8.94	62.3	2.32	58.9	64.14	44.1	42.34	44.5	25.22	49.3
10.8	9.33	60.5	2.65	60.9	67.11	44.6	42.66	46.5	25.59	47.3
20.7	9.71	59.3	2.98	62.9	70.03	45.6	42.98	48.4	25.96	45.9
30.7	10.08	58.6	3.28	64.8	72.83	47.3	43.29	50.2	26.32	44.9
Feb. 9.7	10.42	58.4	3.57	66.6	75.45	49.4	43.57	51.7	26.66	44.5
19.6	10.73	58.8	3.82	68.2	77.82	52.0	43.83	53.0	26.96	44.7
Mar. 1.6	10.99	59.8	4.05	69.7	79.89	55.0	44.05	53.9	27.23	45.4
11.6	11.20	61.2	4.23	70.9	81.63	58.3	44.24	54.6	27.45	46.5
21.6	11.36	62.9	4.38	71.9	83.02	61.8	44.40	55.0	27.62	48.0
31.6	11.47	65.0	4.49	72.7	84.02	65.4	44.52	55.2	27.75	49.9
Apr. 10.5	11.53	67.3	4.57	73.2	84.63	69.1	44.60	55.1	27.83	52.1
20.5	11.55	69.7	4.62	73.6	84.84	72.7	44.66	54.8	27.87	54.4
30.5	11.52	72.1	4.64	73.7	84.66	76.3	44.68	54.3	27.87	56.7
May 10.4	11.45	74.4	4.64	73.7	84.10	79.7	44.68	53.7	27.83	59.0
20.4	11.35	76.5	4.61	73.6	83.16	82.8	44.66	53.0	27.76	61.2
30.4	11.23	78.5	4.56	73.3	81.89	85.5	44.61	52.3	27.66	63.2
June 9.3	11.08	80.2	4.49	72.9	80.30	87.9	44.55	51.5	27.53	65.0
19.3	10.91	81.5	4.41	72.5	78.43	89.9	44.47	50.7	27.39	66.4
29.3	10.73	82.4	4.31	71.9	76.35	91.4	44.37	49.9	27.22	67.6
July 9.3	10.54	83.0	4.20	71.3	74.10	92.3	44.26	49.2	27.05	68.3
19.2	10.35	83.2	4.08	70.6	71.75	92.7	44.14	48.5	26.87	68.7
29.2	10.16	82.9	3.95	69.9	69.38	92.5	44.02	47.9	26.69	68.7
Aug. 8.2	9.97	82.3	3.83	69.2	67.06	91.7	43.89	47.4	26.51	68.3
18.2	9.80	81.3	3.71	68.5	64.86	90.4	43.77	47.0	26.33	67.5
28.1	9.65	79.8	3.60	67.8	62.88	88.6	43.66	46.7	26.17	66.3
Sept. 7.1	9.52	78.0	3.51	67.2	61.19	86.3	43.56	46.6	26.03	64.8
17.1	9.42	75.9	3.44	66.7	59.86	83.7	43.49	46.7	25.92	62.9
27.0	9.36	73.5	3.41	66.4	58.95	80.8	43.45	46.9	25.85	60.7
Oct. 7.0	9.34	70.8	3.41	66.2	58.51	77.7	43.44	47.4	25.81	58.2
17.0	9.37	67.9	3.46	66.3	58.57	74.5	43.47	48.1	25.82	55.5
27.0	9.45	64.8	3.55	66.6	59.15	71.4	43.54	49.0	25.88	52.5
Nov. 5.9	9.60	61.6	3.69	67.2	60.23	68.5	43.67	50.2	26.00	49.4
15.9	9.79	58.4	3.87	68.1	61.78	65.9	43.84	51.7	26.17	46.3
25.9	10.04	55.3	4.10	69.3	63.76	63.7	44.05	53.4	26.40	43.1
Dec. 5.9	10.34	52.2	4.36	70.7	66.10	62.0	44.30	55.2	26.67	40.1
15.8	10.67	49.5	4.66	72.3	68.72	60.8	44.58	57.2	26.98	37.2
25.8	11.04	47.0	4.98	74.2	71.53	60.3	44.89	59.2	27.33	34.7
35.8	11.42	45.0	5.30	76.1	74.45	60.4	45.21	61.3	27.69	32.5

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	m Virginis.		η Ursæ Majoris.		η Bootis.		θ Apodis.		β Centauri.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	h m 13 36	° ′ − 8 12	h m 13 43	° ′ +49 47	h m 13 50	° ′ +18 52	h m 13 55	° ′ −76 19	h m 13 56	° ′ −59 53
	s	″	s	″	s	″	s	″	s	″
Jan. 0.8	28.50	30.7	40.24	51.3	1.19	71.5	47.09	7.8	55.04	45.5
10.8	28.83 .33	32.6 1.9	40.66 .42	49.4 1.9	1.52 .33	69.4 2.1	48.19 1.10	8.1 0.3	55.61 .57	46.2 0.7
20.8	29.15 .32	34.5 1.9	41.09 .43	48.0 1.4	1.85 .33	67.6 1.8	49.30 1.11	8.9 0.8	56.18 .57	47.3 1.1
30.7	29.46 .31	36.4 1.9	41.51 .42	47.3 0.7	2.17 .32	66.1 1.5	50.38 1.08	10.2 1.3	56.74 .56	48.9 1.6
Feb. 9.7	29.75 .29 .26	38.1 1.7 1.5	41.91 .40 .37	47.1 0.2 0.5	2.47 .30 .28	65.0 1.1 0.6	51.40 1.02 0.96	12.1 1.9 2.3	57.26 .52 .49	50.9 2.0 2.3
19.7	30.01 .23	39.6 1.3	42.28 .32	47.6 1.0	2.75 .25	64.4 0.2	52.36 0.87	14.4 2.6	57.75 .44	53.2 2.6
Mar. 1.6	30.24 .20	40.9 1.1	42.60 .28	48.6 1.5	3.00 .21	64.2 0.2	53.23 0.75	17.0 3.0	58.19 .38	55.8 2.7
11.6	30.44 .16	42.0 0.8	42.88 .22	50.1 2.0	3.21 .17	64.4 0.6	53.98 0.64	20.0 3.2	58.57 .33	58.5 2.9
21.6	30.60 .13	42.8 0.6	43.10 .16	52.1 2.4	3.38 .14	65.0 0.9	54.62 0.51	23.2 3.3	58.90 .27	61.4 3.0
31.6	30.73 .09	43.4 0.4	43.26 .10	54.5 2.6	3.52 .10	65.9 1.3	55.13 0.38	26.5 3.4	59.17 .20	64.4 2.9
Apr. 10.5	30.82 .07	43.8 0.2	43.36 .05	57.1 2.7	3.62 .07	67.2 1.3	55.51 0.25	29.9 3.5	59.37 .15	67.3 2.9
20.5	30.89 .03	44.0 0.0	43.41 .01	59.8 2.8	3.69 .04	68.5 1.5	55.76 0.11	33.4 3.3	59.52 .08	70.2 2.8
30.5	30.92 .01	44.0 0.2	43.40 .05	62.6 2.7	3.73 .00	70.0 1.6	55.87 0.02	36.7 3.2	59.60 .03	73.0 2.6
May 10.5	30.93 .01	43.8 0.3	43.35 .10	65.3 2.6	3.73 .02	71.6 1.7	55.85 0.15	39.9 3.0	59.63 .03	75.6 2.4
20.4	30.92 .04	43.5 0.4	43.25 .14	67.9 2.3	3.71 .05	73.3 1.5	55.70 0.27	42.9 2.8	59.60 .09	78.0 2.2
30.4	30.88 .06	43.1 0.4	43.11 .17	70.2 2.0	3.66 .07	74.8 1.5	55.43 0.40	45.7 2.4	59.51 .14	80.2 1.8
June 9.4	30.82 .07	42.7 0.6	42.94 .20	72.2 1.6	3.59 .09	76.3 1.3	55.03 0.50	48.1 2.0	59.37 .19	82.0 1.4
19.3	30.75 .10	42.1 0.6	42.74 .22	73.8 1.2	3.50 .10	77.6 1.1	54.53 0.59	50.1 1.5	59.18 .23	83.4 1.1
29.3	30.65 .10	41.5 0.6	42.52 .24	75.0 0.8	3.40 .12	78.7 1.0	53.94 0.68	51.6 1.1	58.95 .27	84.5 0.7
July 9.3	30.55 .12	40.9 0.7	42.28 .25	75.8 0.4	3.28 .14	79.7 0.6	53.26 0.73	52.7 0.6	58.68 .27	85.2 0.2
19.3	30.43 .13	40.2 0.7	42.03 .25	76.2 0.1	3.14 .14	80.3 0.5	52.53 0.76	53.3 0.0	58.39 .32	85.4 0.2
29.2	30.30 .13	39.5 0.6	41.78 .25	76.1 0.6	3.00 .15	80.8 0.1	51.77 0.78	53.3 0.5	58.07 .33	85.2 0.7
Aug. 8.2	30.17 .12	38.9 0.6	41.53 .24	75.5 1.0	2.85 .14	80.9 0.1	50.99 0.75	52.8 1.0	57.74 .32	84.5 1.1
18.2	30.05 .12	38.3 0.6	41.29 .23	74.5 1.5	2.71 .14	80.8 0.3	50.24 0.71	51.8 1.5	57.42 .30	83.4 1.5
28.2	29.93 .10	37.7 0.5	41.06 .20	73.0 1.9	2.57 .12	80.5 0.7	49.53 0.63	50.3 2.0	57.12 .27	81.9 1.9
Sept. 7.1	29.83 .08	37.2 0.3	40.86 .16	71.1 2.3	2.45 .10	79.8 1.0	48.90 0.53	48.3 2.4	56.85 .23	80.0 2.1
17.1	29.75 .05	36.9 0.2	40.70 .13	68.8 2.6	2.35 .07	78.8 1.2	48.37 0.39	45.9 2.6	56.62 .16	77.9 2.4
27.1	29.70 .02	36.7 0.0	40.57 .08	66.2 2.9	2.28 .04	77.6 1.5	47.98 0.24	43.3 2.9	56.46 .09	75.5 2.4
Oct. 7.0	29.68 .03	36.7 0.2	40.49 .03	63.3 3.2	2.24 .00	76.1 1.8	47.74 0.07	40.4 3.0	56.37 .01	73.1 2.5
17.0	29.71 .08	36.9 0.4	40.46 .04	60.1 3.4	2.24 .05	74.3 2.0	47.67 0.12	37.4 3.0	56.36 .08	70.6 2.4
27.0	29.79 .12	37.3 0.7	40.50 .10	56.7 3.5	2.29 .10	72.3 2.3	47.79 0.30	34.4 2.8	56.44 .17	68.2 2.3
Nov. 6.0	29.91 .16	38.0 1.0	40.60 .16	53.2 3.5	2.39 .14	70.0 2.4	48.09 0.48	31.6 2.6	56.61 .26	65.9 1.9
15.9	30.07 .22	39.0 1.3	40.76 .23	49.7 3.4	2.53 .19	67.6 2.6	48.57 0.65	29.0 2.2	56.87 .34	64.0 1.6
25.9	30.29 .25	40.3 1.4	40.99 .29	46.3 3.3	2.72 .24	65.0 2.5	49.22 0.80	26.8 1.8	57.21 .42	62.4 1.2
Dec. 5.9	30.54 .28	41.7 1.7	41.28 .34	43.0 3.0	2.96 .27	62.5 2.6	50.02 0.92	25.0 1.3	57.63 .48	61.2 0.7
15.8	30.82 .31	43.4 1.8	41.62 .38	40.0 2.7	3.23 .30	59.9 2.5	50.94 1.01	23.7 0.7	58.11 .53	60.5 0.2
25.8	31.13 .32	45.2 1.9	42.00 .41	37.3 2.3	3.53 .32	57.4 2.3	51.95 1.07	23.0 0.2	58.64 .55	60.3 0.4
35.8	31.45	47.1	42.41	35.0	3.85	55.1	53.02	22.8	59.19	60.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π Hydræ. Right Ascension.	Declination South.	a Draconis. Right Ascension.	Declination North.	d Bootis. Right Ascension.	Declination North.	κ Virginis. Right Ascension.	Declination South.	4 Ursæ Minoris. Right Ascension.	Declination North.
	h m 14 00	° ′ −26 12	h m 14 01	° ′ +64 50	h m 14 05	° ′ +25 32	h m 14 07	° ′ −9 49	h m 14 09	° ′ +77 59
Jan. 0.8	s 47.80 (.35)	30.6 (1.5)	s 42.50 (.57)	20.8 (1.9)	s 55.76 (.33)	71.1 (2.2)	s 40.31 (.33)	1.8 (1.8)	s 8.78 (1.03)	70.0 (1.8)
10.8	48.15 (.36)	32.1 (1.7)	43.07 (.59)	18.9 (1.3)	56.09 (.34)	68.9 (1.9)	40.64 (.32)	3.6 (1.9)	9.81 (1.10)	68.2 (1.1)
20.8	48.51 (.34)	33.8 (1.8)	43.66 (.59)	17.6 (0.6)	56.43 (.33)	67.0 (1.4)	40.96 (.32)	5.5 (1.7)	10.91 (1.11)	67.1 (0.4)
30.7	48.85 (.33)	35.6 (1.8)	44.25 (.58)	17.0 (0.0)	56.76 (.32)	65.6 (1.0)	41.28 (.31)	7.2 (1.7)	12.02 (1.10)	66.7 (0.2)
Feb. 9.7	49.18 (.30)	37.4 (1.9)	44.83 (.54)	17.0 (0.7)	57.08 (.29)	64.6 (0.5)	41.59 (.28)	8.9 (1.4)	13.12 (1.04)	66.9 (0.9)
19.7	49.48 (.27)	39.3 (1.9)	45.37 (.48)	17.7 (1.3)	57.37 (.27)	64.1 (0.0)	41.87 (.25)	10.3 (1.3)	14.16 (0.94)	67.8 (1.5)
Mar. 1.7	49.75 (.24)	41.2 (1.8)	45.85 (.41)	19.0 (1.9)	57.64 (.23)	64.1 (0.5)	42.12 (.22)	11.6 (1.1)	15.10 (0.81)	69.3 (2.0)
11.6	49.99 (.20)	43.0 (1.6)	46.26 (.34)	20.9 (2.3)	57.87 (.19)	64.6 (0.9)	42.34 (.20)	12.7 (0.9)	15.91 (0.66)	71.3 (2.5)
21.6	50.19 (.17)	44.6 (1.5)	46.60 (.25)	23.2 (2.7)	58.06 (.16)	65.5 (1.2)	42.54 (.16)	13.6 (0.6)	16.57 (0.49)	73.8 (2.9)
31.6	50.36 (.13)	46.1 (1.4)	46.85 (.16)	25.9 (3.0)	58.22 (.12)	66.7 (1.5)	42.70 (.12)	14.2 (0.4)	17.06 (0.30)	76.7 (3.1)
Apr. 10.5	50.49 (.10)	47.5 (1.2)	47.01 (.07)	28.9 (3.1)	58.34 (.08)	68.2 (1.8)	42.82 (.10)	14.6 (0.2)	17.36 (0.11)	79.8 (3.2)
20.5	50.59 (.07)	48.7 (1.1)	47.08 (.01)	32.0 (3.1)	58.42 (.05)	70.0 (1.9)	42.92 (.07)	14.8 (0.1)	17.47 (0.07)	83.0 (3.2)
30.5	50.66 (.04)	49.8 (0.9)	47.07 (.10)	35.1 (3.0)	58.47 (.02)	71.9 (2.0)	42.99 (.04)	14.9 (0.1)	17.40 (0.25)	86.2 (3.1)
May 10.5	50.70 (.01)	50.7 (0.7)	46.97 (.17)	38.1 (2.9)	58.49 (.02)	73.9 (2.0)	43.03 (.01)	14.8 (0.3)	17.15 (0.42)	89.3 (2.9)
20.4	50.71 (.02)	51.4 (0.5)	46.80 (.23)	41.0 (2.6)	58.47 (.05)	75.9 (1.9)	43.04 (.01)	14.5 (0.3)	16.73 (0.57)	92.2 (2.6)
30.4	50.69 (.05)	51.9 (0.3)	46.57 (.30)	43.6 (2.2)	58.42 (.07)	77.8 (1.7)	43.03 (.04)	14.2 (0.4)	16.16 (0.69)	94.8 (2.2)
June 9.4	50.64 (.07)	52.2 (0.1)	46.27 (.34)	45.8 (1.8)	58.35 (.09)	79.5 (1.6)	42.99 (.06)	13.8 (0.5)	15.47 (0.80)	97.0 (1.7)
19.4	50.57 (.09)	52.3 (0.0)	45.93 (.39)	47.6 (1.3)	58.26 (.11)	81.1 (1.3)	42.93 (.08)	13.3 (0.5)	14.67 (0.89)	98.7 (1.3)
29.3	50.48 (.12)	52.3 (0.2)	45.54 (.41)	48.9 (0.9)	58.15 (.13)	82.4 (1.0)	42.85 (.10)	12.8 (0.6)	13.78 (0.95)	100.0 (0.7)
July 9.3	50.36 (.13)	52.1 (0.4)	45.13 (.43)	49.8 (0.3)	58.02 (.15)	83.4 (0.8)	42.75 (.11)	12.2 (0.6)	12.83 (0.98)	100.7 (0.2)
19.3	50.23 (.14)	51.7 (0.6)	44.70 (.44)	50.1 (0.2)	57.87 (.16)	84.2 (0.5)	42.64 (.13)	11.6 (0.7)	11.85 (1.00)	100.9 (0.4)
29.2	50.09 (.16)	51.1 (0.7)	44.26 (.44)	49.9 (0.7)	57.71 (.16)	84.7 (0.1)	42.51 (.13)	10.9 (0.6)	10.85 (1.00)	100.5 (0.8)
Aug. 8.2	49.93 (.15)	50.4 (0.9)	43.82 (.43)	49.2 (1.2)	57.55 (.16)	84.8 (0.2)	42.38 (.14)	10.3 (0.6)	9.85 (0.96)	99.7 (1.4)
18.2	49.78 (.15)	49.5 (1.0)	43.39 (.40)	48.0 (1.7)	57.39 (.16)	84.6 (0.5)	42.24 (.14)	9.7 (0.5)	8.89 (0.91)	98.3 (1.9)
28.2	49.63 (.13)	48.5 (1.0)	42.99 (.37)	46.3 (2.2)	57.23 (.14)	84.1 (0.8)	42.10 (.12)	9.2 (0.5)	7.98 (0.84)	96.4 (2.4)
Sept. 7.1	49.50 (.11)	47.5 (1.1)	42.62 (.32)	44.1 (2.6)	57.09 (.12)	83.3 (1.2)	41.98 (.10)	8.7 (0.4)	7.14 (0.75)	94.0 (2.7)
17.1	49.39 (.08)	46.4 (1.1)	42.30 (.26)	41.5 (2.9)	56.97 (.10)	82.1 (1.5)	41.88 (.08)	8.3 (0.3)	6.39 (0.63)	91.3 (3.1)
27.1	49.31 (.04)	45.3 (1.1)	42.04 (.20)	38.6 (3.2)	56.87 (.06)	80.6 (1.8)	41.80 (.04)	8.0 (0.1)	5.76 (0.49)	88.2 (3.4)
Oct. 7.1	49.27 (.00)	44.3 (0.8)	41.84 (.11)	35.4 (3.5)	56.81 (.02)	78.8 (2.1)	41.76 (.01)	7.9 (0.0)	5.27 (0.34)	84.8 (3.6)
17.0	49.27 (.06)	43.5 (0.7)	41.73 (.03)	31.9 (3.7)	56.79 (.02)	76.7 (2.3)	41.75 (.05)	7.9 (0.3)	4.93 (0.17)	81.2 (3.7)
27.0	49.33 (.11)	42.8 (0.5)	41.70 (.06)	28.2 (3.8)	56.81 (.08)	74.4 (2.6)	41.80 (.09)	8.2 (0.6)	4.76 (0.00)	77.5 (3.8)
Nov. 6.0	49.44 (.16)	42.3 (0.1)	41.76 (.16)	24.4 (3.7)	56.89 (.13)	71.8 (2.7)	41.89 (.14)	8.8 (0.8)	4.76 (0.19)	73.7 (3.8)
15.9	49.60 (.21)	42.2 (0.1)	41.92 (.25)	20.7 (3.7)	57.02 (.17)	69.1 (2.8)	42.03 (.18)	9.6 (1.0)	4.95 (0.38)	69.9 (3.7)
25.9	49.81 (.26)	42.3 (0.5)	42.17 (.35)	17.0 (3.4)	57.19 (.23)	66.3 (2.8)	42.21 (.23)	10.6 (1.3)	5.33 (0.55)	66.2 (3.4)
Dec. 5.9	50.07 (.30)	42.8 (0.8)	42.52 (.41)	13.6 (3.2)	57.42 (.26)	63.5 (2.8)	42.44 (.27)	11.9 (1.5)	5.88 (0.72)	62.8 (3.1)
15.9	50.37 (.33)	43.6 (1.1)	42.93 (.49)	10.4 (2.8)	57.68 (.30)	60.7 (2.7)	42.71 (.30)	13.4 (1.7)	6.60 (0.87)	59.7 (2.7)
25.8	50.70 (.34)	44.7 (1.3)	43.42 (.55)	7.6 (2.2)	57.98 (.32)	58.0 (2.4)	43.01 (.31)	15.1 (1.7)	7.47 (0.98)	57.0 (2.1)
35.8	51.04	46.0	43.97	5.4	58.30	55.6	43.32	16.8	8.45	54.9

FIXED STARS, 1902.
(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	δ Octantis		α Bootis (Arcturus.)		λ Bootis		λ Virginis		θ Bootis	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension	Declination North.
	h m 14 11	° ′ −83 12	h m 14.11	° ′ +19 41	h m 14 12	° ′ +46 31	h m 14 13	° ′ −12 55	h m 14 21	° ′ +52 17
	s	″	s	″	s	″	s	″	s	″
Jan. 0.8	11.12 (2.09)	50.3 (0.1)	11.41 (.32)	25.4 (2.3)	38.86 (.39)	63.1 (2.2)	48.61 (.32)	9.5 (1.7)	50.66 (.42)	58.1 (2.3)
10.8	13.21 (2.14)	50.2 (0.4)	11.73 (.32)	23.1 (1.9)	39.25 (.40)	60.9 (1.7)	48.93 (.33)	11.2 (1.7)	51.08 (.43)	55.8 (1.7)
20.8	15.35 (2.11)	50.6 (1.0)	12.05 (.32)	21.2 (1.6)	39.65 (.40)	59.2 (1.1)	49.26 (.32)	12.9 (1.8)	51.51 (.44)	54.1 (1.2)
30.7	17.46 (2.05)	51.6 (1.5)	12.37 (.31)	19.6 (1.2)	40.05 (.39)	58.1 (0.6)	49.58 (.31)	14.7 (1.7)	51.95 (.43)	52.9 (0.5)
Feb. 9.7	19.51 (1.92)	53.1 (2.0)	12.68 (.29)	18.4 (0.8)	40.44 (.36)	57.5 (0.1)	49.89 (.29)	16.4 (1.5)	52.38 (.41)	52.4 (0.2)
19.7	21.43 (1.77)	55.1 (2.4)	12.97 (.26)	17.6 (0.3)	40.80 (.34)	57.6 (0.7)	50.18 (.26)	17.9 (1.4)	52.79 (.37)	52.6 (0.7)
Mar. 1.7	23.20 (1.57)	57.5 (2.8)	13.23 (.22)	17.3 (0.2)	41.14 (.28)	58.3 (1.2)	50.44 (.23)	19.3 (1.2)	53.16 (.32)	53.3 (1.3)
11.6	24.77 (1.35)	60.3 (3.1)	13.45 (.20)	17.5 (0.5)	41.42 (.25)	59.5 (1.8)	50.67 (.20)	20.5 (0.9)	53.48 (.28)	54.6 (1.9)
21.6	26.12 (1.11)	63.4 (3.3)	13.65 (.15)	18.0 (0.9)	41.67 (.19)	61.3 (2.1)	50.87 (.17)	21.4 (0.8)	53.76 (.22)	56.5 (2.3)
31.6	27.23 (0.85)	66.7 (3.5)	13.80 (.12)	18.9 (1.2)	41.86 (.14)	63.4 (2.4)	51.04 (.13)	22.2 (0.6)	53.98 (.16)	58.8 (2.5)
Apr. 10.5	28.08 (0.58)	70.2 (3.5)	13.92 (.09)	20.1 (1.4)	42.00 (.08)	65.8 (2.7)	51.17 (.11)	22.8 (0.4)	54.14 (.10)	61.3 (2.8)
20.5	28.66 (0.31)	73.7 (3.5)	14.01 (.06)	21.5 (1.6)	42.08 (.04)	68.5 (2.7)	51.28 (.07)	23.2 (0.2)	54.24 (.05)	64.1 (2.9)
30.5	28.97 (0.02)	77.2 (3.4)	14.07 (.02)	23.1 (1.7)	42.12 (.01)	71.2 (2.8)	51.35 (.05)	23.4 (0.1)	54.29 (.01)	67.0 (3.0)
May 10.5	28.99 (0.25)	80.6 (3.2)	14.09 (.01)	24.8 (1.7)	42.11 (.05)	74.0 (2.6)	51.40 (.02)	23.5 (0.1)	54.28 (.06)	70.0 (2.8)
20.4	28.74 (0.52)	83.8 (3.0)	14.08 (.03)	26.5 (1.6)	42.06 (.09)	76.6 (2.5)	51.42 (.01)	23.4 (0.2)	54.22 (.11)	72.8 (2.6)
30.4	28.22 (0.77)	86.8 (2.7)	14.05 (.06)	28.1 (1.6)	41.97 (.13)	79.1 (2.3)	51.41 (.03)	23.2 (0.2)	54.11 (.15)	75.4 (2.4)
June 9.4	27.45 (1.00)	89.5 (2.4)	13.99 (.08)	29.7 (1.4)	41.84 (.16)	81.4 (1.9)	51.38 (.05)	23.0 (0.4)	53.96 (.19)	77.8 (2.0)
19.4	26.45 (1.21)	91.9 (1.9)	13.91 (.10)	31.1 (1.2)	41.68 (.19)	83.3 (1.5)	51.33 (.08)	22.6 (0.4)	53.77 (.22)	79.8 (1.6)
29.3	25.24 (1.39)	93.8 (1.4)	13.81 (.12)	32.3 (1.0)	41.49 (.21)	84.8 (1.2)	51.25 (.10)	22.2 (0.5)	53.55 (.25)	81.4 (1.2)
July 9.3	23.85 (1.52)	95.2 (0.9)	13.69 (.14)	33.3 (0.7)	41.28 (.23)	86.0 (0.7)	51.15 (.11)	21.7 (0.6)	53.30 (.27)	82.6 (0.8)
19.3	22.33 (1.60)	96.1 (0.4)	13.55 (.15)	34.0 (0.5)	41.05 (.24)	86.7 (0.3)	51.04 (.13)	21.1 (0.6)	53.03 (.28)	83.4 (0.3)
29.3	20.73 (1.64)	96.5 (0.2)	13.40 (.15)	34.5 (0.2)	40.81 (.24)	87.0 (0.2)	50.91 (.14)	20.5 (0.6)	52.75 (.29)	83.7 (0.3)
Aug. 8.2	19.09 (1.61)	96.3 (0.7)	13.25 (.16)	34.7 (0.0)	40.57 (.24)	86.8 (0.7)	50.77 (.14)	19.9 (0.7)	52.46 (.29)	83.4 (0.7)
18.2	17.48 (1.53)	95.6 (1.3)	13.09 (.15)	34.7 (0.4)	40.33 (.23)	86.1 (1.1)	50.63 (.14)	19.2 (0.6)	52.17 (.28)	82.7 (1.1)
28.2	15.95 (1.39)	94.3 (1.8)	12.94 (.14)	34.3 (0.7)	40.10 (.22)	85.0 (1.5)	50.49 (.13)	18.6 (0.6)	51.89 (.26)	81.6 (1.6)
Sept. 7.1	14.56 (1.19)	92.5 (2.3)	12.80 (.12)	33.6 (0.9)	39.88 (.19)	83.5 (1.9)	50.36 (.11)	18.0 (0.5)	51.63 (.23)	80.0 (2.1)
17.1	13.37 (0.94)	90.2 (2.6)	12.68 (.10)	32.7 (1.3)	39.69 (.16)	81.6 (2.4)	50.25 (.08)	17.5 (0.4)	51.40 (.20)	77.9 (2.5)
27.1	12.43 (0.64)	87.6 (2.9)	12.58 (.06)	31.4 (1.5)	39.53 (.11)	79.2 (2.6)	50.17 (.05)	17.1 (0.3)	51.20 (.15)	75.4 (2.8)
Oct. 7.1	11.79 (0.30)	84.7 (3.1)	12.52 (.02)	29.9 (1.8)	39.42 (.06)	76.6 (3.0)	50.12 (.01)	16.8 (0.1)	51.05 (.09)	72.6 (3.1)
17.0	11.49 (0.05)	81.6 (3.1)	12.50 (.02)	28.1 (2.1)	39.36 (.01)	73.6 (3.2)	50.11 (.03)	16.7 (0.1)	50.96 (.04)	69.5 (3.3)
27.0	11.54 (0.42)	78.5 (3.1)	12.52 (.07)	26.0 (2.3)	39.35 (.05)	70.4 (3.3)	50.14 (.09)	16.8 (0.3)	50.92 (.04)	66.2 (3.5)
Nov. 6.0	11.96 (0.78)	75.4 (2.8)	12.59 (.12)	23.7 (2.5)	39.40 (.12)	67.1 (3.5)	50.23 (.14)	17.1 (0.6)	50.96 (.10)	62.7 (3.7)
16.0	12.74 (1.12)	72.6 (2.6)	12.71 (.17)	21.2 (2.6)	39.52 (.18)	63.6 (3.4)	50.37 (.18)	17.7 (0.9)	51.06 (.17)	59.0 (3.6)
25.9	13.86 (1.42)	70.0 (2.2)	12.88 (.22)	18.6 (2.7)	39.70 (.24)	60.2 (3.4)	50.55 (.23)	18.6 (1.1)	51.23 (.25)	55.4 (3.5)
Dec. 5.9	15.28 (1.67)	67.8 (1.6)	13.10 (.25)	15.9 (2.7)	39.94 (.30)	56.8 (3.2)	50.78 (.27)	19.7 (1.3)	51.48 (.30)	51.9 (3.3)
15.9	16.95 (1.88)	66.2 (1.2)	13.35 (.29)	13.2 (2.6)	40.24 (.34)	53.6 (2.9)	51.05 (.29)	21.0 (1.5)	51.78 (.36)	48.6 (3.0)
25.8	18.83 (2.02)	65.0 (0.5)	13.64 (.31)	10.6 (2.4)	40.58 (.34)	50.7 (2.5)	51.34 (.32)	22.5 (1.7)	52.14 (.39)	45.6 (2.6)
35.8	20.85	64.5	13.95	8.2	40.95	48.2	51.66	24.2	52.53	43.0

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ρ Bootis. Right Ascension.	ρ Bootis. Declination North.	5 Ursæ Minoris. Right Ascension.	5 Ursæ Minoris. Declination North.	a² Centauri. Right Ascension	a² Centauri. Declination South.	33 Bootis. Right Ascension.	33 Bootis. Declination North.	α Apodis. Right Ascension.	α Apodis. Declination South.
	h m 14 27	° ' +30 47	h m 14 27	° ' +76 07	h m. 14 32	° ' −60 25	h m 14 35	° ' +44 49	h m 14 35	° ' −78 37
	s	"	s	"	s	"	s	"	s	"
Jan. 0.8	36.05 .33	55.4 2.3	39.22 .88	37.0 2.0	56.73 .55	36.0 0.2	10.65 .37	25.8 2.4	40.17 1.27	25.7 0.4
10.8	36.38 .34	53.1 1.9	40.10 .94	35.0 1.4	57.28 .57	36.2 0.6	11.02 .39	23.4 2.0	41.44 1.32	25.3 0.2
20.8	36.72 .35	51.2 1.5	41.04 .97	33.6 0.7	57.85 .56	36.8 1.0	11.41 .39	21.4 1.4	42.76 1.32	25.5 0.7
30.8	37.07 .33	49.7 1.0	42.01 .97	32.9 0.1	58.41 .55	37.8 1.5	11.80 .38	20.0 0.8	44.08 1.30	26.2 1.2
Feb. 9.7	37.40 .31	48.7 0.5	42.98 .93	32.8 0.6	58.96 .52	39.3 1.8	12.18 .37	19.2 0.1	45.38 1.25	27.4 1.7
19.7	37.71 .29	48.2 0.0	43.91 .86	33.4 1.2	59.48 .48	41.1 2.2	12.55 .33	19.1 0.4	46.63 1.16	29.1 2.1
Mar. 1.7	38.00 .26	48.2 0.6	44.77 .76	34.6 1.9	59.96 .44	43.3 2.3	12.88 .31	19.5 1.0	47.79 1.05	31.2 2.5
11.6	38.26 .22	48.8 1.1	45.53 .63	36.5 2.3	60.40 .38	45.6 2.6	13.19 .26	20.5 1.5	48.84 1.05	33.7 2.8
21.6	38.48 .18	49.9 1.4	46.16 .49	38.8 2.7	60.78 .32	48.2 2.6	13.45 .21	22.0 2.0	49.78 0.94	36.5 3.1
31.6	38.66 .14	51.3 1.8	46.65 .34	41.5 3.0	61.10 .27	50.9 2.7	13.66 .17	24.0 2.3	50.58 0.80 0.65	39.6 3.2
Apr. 10.6	38.80 .11	53.1 2.0	46.99 .18	44.5 3.2	61.37 .21	53.6 2.8	13.83 .12	26.3 2.6	51.23 0.50	42.8 3.3
20.5	38.91 .07	55.1 2.2	47.17 .02	47.7 3.3	61.58 .15	56.4 2.7	13.95 .07	28.9 2.7	51.73 0.34	46.1 3.3
30.5	38.98 .03	57.3 2.3	47.19 .14	51.0 3.3	61.73 .09	59.1 2.6	14.02 .02	31.6 2.7	52.07 0.17	49.4 3.3
May 10.5	39.01 .01	59.6 2.2	47.05 .14	54.2 3.2	61.82 .02	61.7 2.6	14.04 .02	34.4 2.8	52.24 0.00	52.7 3.1
20.5	39.00 .03	61.8 2.2	46.76 .29	57.2 3.0	61.84 .03	64.2 2.5	14.02 .07	37.1 2.7	52.24 0.16	55.8 3.0
30.4	38.97 .07	64.0 2.0	46.34 .54	59.9 2.4	61.81 .10	66.5 2.0	13.95 .10	39.7 2.4	52.08 0.32	58.8 2.7
June 9.4	38.90 .09	66.0 2.0 1.8	45.80 .65	62.3 2.4	61.71 .15	68.5 1.7	13.85 .13	42.1 2.1	51.76 0.46	61.5 2.4
19.4	38.81 .11	67.8 1.6	45.15 .72	64.3 2.0	61.56 .21	70.2 1.3	13.72 .17	44.2 1.7	51.30 0.61	63.9 2.0
29.3	38.70 .14	69.4 1.3	44.43 .80	65.8 1.5	61.35 .25	71.5 1.0	13.55 .19	45.9 1.4	50.69 0.73	65.9 1.6
July 9.3	38.56 .16	70.7 0.9	43.63 .84	66.8 0.5	61.10 .30	72.5 0.6	13.36 .21	47.3 0.9	49.96 0.83	67.5 1.1
19.3	38.40 .17	71.6 0.6	42.79 .86	67.3 0.0	60.80 .32	73.1 0.2	13.15 .23	48.2 0.6	49.13 0.90	68.6 0.6
29.3	38.23 .18	72.2 0.2	41.93 .88	67.3 0.6	60.48 .35	73.3 0.3	12.92 .24	48.8 0.1	48.23 0.95	69.2 0.0
Aug. 8.2	38.05 .19	72.4 0.1	41.05 .86	66.7 1.1	60.13 .36	73.0 0.7	12.68 .25	48.9 0.4	47.28 0.95	69.2 0.5
18.2	37.86 .18	72.3 0.6	40.19 .82	65.6 1.6	59.77 .35	72.3 1.2	12.43 .24	48.5 0.8	46.33 0.94	68.7 1.0
28.2	37.68 .17	71.7 0.9	39.37 .77	64.0 2.1	59.42 .32	71.1 1.5	12.19 .22	47.7 1.3	45.39 0.86	67.7 1.5
Sept. 7.2	37.51 .15	70.8 1.2	38.60 .70	61.9 2.5	59.10 .29	69.6 1.9	11.97 .21	46.4 1.7	44.53 0.77	66.2 2.0
17.1	37.36 .13	69.6 1.6	37.90 .61	59.4 2.9	58.81 .24	67.7 2.1	11.76 .18	44.7 2.1	43.76 0.64	64.2 2.4
27.1	37.23 .09	68.0 2.0	37.29 .49	56.5 3.2	58.57 .17	65.6 2.4	11.58 .13	42.6 2.5	43.12 0.46	61.8 2.7
Oct. 7.1	37.14 .05	66.0 2.3	36.80 .37	53.3 3.5	58.40 .09	63.2 2.4	11.45 .09	40.1 2.8	42.66 0.28	59.1 2.9
17.0	37.09 .01	63.7 2.5	36.43 .22	49.8 3.7	58.31 .00	60.8 2.5	11.36 .04	37.3 3.0	42.38 0.06	56.2 3.0
27.0	37.08 .05	61.2 2.7	36.21 .07	46.1 3.8	58.31 .09	58.3 2.3	11.32 .02	34.3 3.3	42.32 0.16	53.2 3.0
Nov. 6.0	37.13 .10	58.5 2.9	36.14 .07	42.3 3.8	58.40 .09	56.0 2.3	11.34 .09	31.0 3.3	42.48 0.39	50.2 2.9
16.0	37.23 .16	55.6 3.1	36.24 .10	38.5 3.8	58.59 .19	53.8 2.2	11.43 .15	27.6 3.4	42.87 0.60	47.3 2.6
25.9	37.39 .20	52.5 3.1	36.50 .26	34.8 3.7	58.86 .27	51.9 1.9	11.58 .20	24.1 3.5	43.47 0.80	44.7 2.3
Dec. 5.9	37.59 .25	49.5 3.0	36.92 .42	31.3 3.5	59.23 .37	50.3 1.6	11.78 .27	20.7 3.4	44.27 0.97	42.4 1.8
15.9	37.84 .29	46.5 2.8	37.49 .57	28.0 3.3	59.66 .43	49.2 1.1	12.05 .31	17.4 3.0	45.24 1.11	40.6 1.3
25.9	38.13 .32	43.7 2.8	38.20 .71	25.2 2.8	60.15 .49	48.6 0.6	12.36 .35	14.4 3.0	46.35 1.22	39.3 0.8
35.8	38.45	41.2 2.5	39.03 .83	22.8 2.4	60.68 .53	48.4 0.2	12.71	11.7 2.7	47.57	38.5

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FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Bootis. Right Ascension. 14 40	ε Bootis. Declination North. +27 28	a² Libræ. Right Ascension. 14 45	a² Libræ. Declination South. −15 38	β Ursæ Minoris. Right Ascension. 14 50	β Ursæ Minoris. Declination North. +74 32	β Bootis. Right Ascension. 14 58	β Bootis. Declination North. +40 46	γ Scorpii. Right Ascension. 14 58	γ Scorpii. Declina tion South. −24 53
	h m / s	° ' / "	h m / s	° ' / "	h m / s	° ' / "	h m / s	° ' / "	h m / s	° ' / "
Jan. 0.8	42.07	65.8	27.46	0.0	55.02	66.4	14.47	27.0	20.09	41.1
10.8	42.39	63.4	27.78	1.5	55.77	64.1	14.81	24.4	20.42	42.2
20.8	42.72	61.3	28.11	3.1	56.60	62.4	15.17	22.2	20.76	43.4
30.8	43.05	59.7	28.43	4.7	57.47	61.3	15.54	20.6	21.11	44.8
Feb. 9.7	43.38	58.6	28.75	6.2	58.35	60.9	15.90	19.5	21.45	46.3
19.7	43.69	58.0	29.05	7.7	59.21	61.2	16.26	19.0	21.77	47.8
Mar. 1.7	43.97	57.9	29.33	9.0	60.02	62.1	16.59	19.2	22.08	49.2
11.7	44.23	58.2	29.59	10.2	60.76	63.6	16.89	19.9	22.36	50.6
21.6	44.46	59.1	29.82	11.2	61.39	65.7	17.16	21.1	22.61	51.9
31.6	44.65	60.3	30.02	12.0	61.91	68.3	17.39	22.8	22.83	53.1
Apr. 10.6	44.81	61.9	30.18	12.6	62.29	71.2	17.58	24.9	23.02	54.2
20.5	44.93	63.8	30.32	13.1	62.54	74.3	17.72	27.3	23.18	55.1
30.5	45.01	65.9	30.43	13.4	62.64	77.5	17.82	29.9	23.31	56.0
May 10.5	45.06	68.0	30.51	13.6	62.60	80.8	17.88	32.6	23.41	56.7
20.5	45.07	70.2	30.56	13.7	62.43	83.9	17.89	35.3	23.48	57.2
30.4	45.06	72.3	30.59	13.6	62.12	86.8	17.87	37.9	23.52	57.7
June 9.4	45.01	74.3	30.58	13.5	61.70	89.5	17.81	40.4	23.52	58.0
19.4	44.93	76.2	30.55	13.2	61.18	91.8	17.71	42.6	23.50	58.2
29.4	44.83	77.8	30.48	12.9	60.57	93.6	17.57	44.6	23.44	58.3
July 9.3	44.70	79.1	30.40	12.5	59.89	94.9	17.41	46.2	23.36	58.3
19.3	44.56	80.1	30.29	12.1	59.15	95.8	17.22	47.4	23.25	58.1
29.3	44.40	80.8	30.16	11.6	58.38	96.1	17.01	48.2	23.11	57.8
Aug. 8.2	44.23	81.2	30.02	11.1	57.59	95.9	16.79	48.6	22.96	57.4
18.2	44.05	81.2	29.87	10.5	56.79	95.2	16.56	48.5	22.79	56.8
28.2	43.87	80.8	29.72	9.9	56.01	93.9	16.33	48.0	22.62	56.1
Sept. 7.2	43.70	80.1	29.57	9.3	55.27	92.2	16.11	47.1	22.46	55.4
17.1	43.54	79.1	29.44	8.7	54.58	90.0	15.90	45.7	22.31	54.5
27.1	43.41	77.7	29.33	8.2	53.97	87.3	15.71	43.9	22.18	53.7
Oct. 7.1	43.31	75.9	29.25	7.8	53.45	84.3	15.56	41.7	22.09	52.9
17.1	43.25	73.9	29.21	7.6	53.04	81.0	15.45	39.2	22.04	52.1
27.0	43.23	71.6	29.21	7.5	52.76	77.5	15.39	36.4	22.03	51.5
Nov. 6.0	43.27	69.0	29.27	7.6	52.61	73.7	15.39	33.4	22.08	51.0
16.0	43.35	66.2	29.38	7.9	52.61	69.9	15.44	30.1	22.18	50.7
25.9	43.49	63.3	29.54	8.5	52.76	66.1	15.56	26.8	22.33	50.7
Dec. 5.9	43.68	60.4	29.74	9.4	53.07	62.5	15.74	23.4	22.54	51.0
15.9	43.92	57.5	29.99	10.4	53.52	59.1	15.97	20.1	22.79	51.5
25.9	44.19	54.7	30.27	11.7	54.10	56.0	16.25	17.0	23.08	52.2
35.8	44.50	52.1	30.58	13.1	54.80	53.4	16.56	14.2	23.40	53.2

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Bootis. Right Ascension.	δ Bootis. Declination North.	β Libræ. Right Ascension.	β Libræ. Declination South.	ρ Octantis. Right Ascension.	ρ Octantis. Declination South.	μ¹ Bootis. Right Ascension.	μ¹ Bootis. Declination North.	γ² Ursæ Minoris. Right Ascension.	γ² Ursæ Minoris. Declination North.
	h m 15 11	° ′ +33 40	h m 15 11	° ′ − 9 01	h m 15 20	° ′ −84 08	h m 15 20	° ′ +37 42	h m 15 20	° ′ +72 10
	s	″	s	″	s	″	s	″	s	″
Jan. 0.9	32.45	41.2	43.89	13.8	35.27	2.6	46.47	66.7	48.92	45.3
10.8	32.76	38.6	44.19	15.4	37.50	1.4	46.78	64.0	49.53	42.7
20.8	33.09	36.3	44.50	17.0	39.90	0.7	47.12	61.7	50.22	40.6
30.8	33.43	34.6	44.82	18.5	42.40	0.5	47.47	59.8	50.96	39.1
Feb. 9.8	33.77	33.3	45.13	19.9	44.92	0.9	47.82	58.5	51.73	38.2
19.7	34.10	32.6	45.43	21.2	47.42	1.9	48.16	57.8	52.50	38.0
Mar. 1.7	34.42	32.4	45.72	22.3	49.83	3.3	48.49	57.7	53.24	38.5
11.7	34.71	32.8	45.98	23.2	52.10	5.2	48.80	58.2	53.93	39.7
21.6	34.97	33.8	46.22	23.8	54.19	7.4	49.08	59.2	54.55	41.5
31.6	35.20	35.2	46.44	24.2	56.06	10.0	49.32	60.7	55.08	43.7
Apr. 10.6	35.39	37.0	46.62	24.4	57.68	12.9	49.52	62.6	55.50	46.4
20.6	35.54	39.1	46.78	24.5	59.02	16.0	49.69	64.8	55.81	49.4
30.5	35.66	41.4	46.91	24.3	60.06	19.2	49.82	67.3	55.99	52.6
May 10.5	35.74	43.9	47.02	24.1	60.77	22.5	49.90	69.9	56.06	55.9
20.5	35.78	46.4	47.09	23.7	61.15	25.8	49.95	72.6	56.01	59.2
30.5	35.78	48.9	47.13	23.2	61.19	29.0	49.95	75.3	55.84	62.3
June 9.4	35.75	51.2	47.15	22.7	60.90	32.0	49.92	77.8	55.56	65.1
19.4	35.68	53.4	47.13	22.1	60.27	34.9	49.85	80.1	55.18	67.7
29.4	35.58	55.3	47.09	21.5	59.33	37.4	49.75	82.2	54.71	70.0
July 9.3	35.45	57.0	47.02	20.9	58.11	39.6	49.61	84.0	54.17	71.7
19.3	35.30	58.3	46.92	20.4	56.64	41.3	49.44	85.4	53.56	73.0
29.3	35.12	59.2	46.80	19.8	54.96	42.6	49.25	86.5	52.91	73.8
Aug. 8.3	34.93	59.8	46.66	19.3	53.13	43.3	49.04	87.1	52.22	74.1
18.2	34.72	59.9	46.51	18.8	51.22	43.4	48.82	87.3	51.52	73.8
28.2	34.52	59.7	46.35	18.4	49.29	43.0	48.59	87.1	50.82	73.0
Sept. 7.2	34.31	59.1	46.20	18.0	47.41	42.1	48.36	86.4	50.13	71.7
17.2	34.12	58.0	46.06	17.7	45.66	40.6	48.15	85.4	49.48	69.9
27.1	33.94	56.6	45.93	17.5	44.11	38.6	47.96	83.9	48.88	67.7
Oct. 7.1	33.80	54.8	45.83	17.4	42.83	36.1	47.79	82.0	48.35	65.0
17.1	33.70	52.6	45.77	17.5	41.88	33.4	47.67	79.7	47.91	62.0
27.0	33.64	50.1	45.75	17.8	41.31	30.4	47.59	77.2	47.58	58.7
Nov. 6.0	33.63	47.4	45.77	18.3	41.15	27.3	47.56	74.3	47.36	55.1
16.0	33.67	44.4	45.85	19.0	41.42	24.1	47.59	71.2	47.27	51.4
26.0	33.77	41.3	45.98	19.9	42.11	21.1	47.68	68.0	47.32	47.6
Dec. 5.9	33.93	38.1	46.15	21.0	43.22	18.3	47.82	64.7	47.50	43.8
15.9	34.14	35.0	46.37	22.3	44.70	15.9	48.02	61.4	47.82	40.3
25.9	34.40	32.0	46.63	23.7	46.51	13.9	48.27	58.3	48.26	37.0
35.9	34.69	29.2	46.91	25.3	48.59	12.3	48.56	55.4	48.81	34.0

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	β Coronæ Borealis. Right Ascension.	β Coronæ Borealis. Declination North.	α Coronæ Borealis. Right Ascension.	α Coronæ Borealis. Declination North.	α Serpentis. Right Ascension.	α Serpentis. Declination North.	ε Serpentis. Right Ascension.	ε Serpentis. Declination North.	ζ Ursæ Minoris. Right Ascension.	ζ Ursæ Minoris. Declination North.
	h m 15 23	° ' +29 26	h m 15 30	° ' +27 02	h m 15 39	° ' + 6 43	h m 15 45	° ' + 4 46	h m 15 47	° ' +78 05
	s	''	s	''	s	''	s	''	s	''
Jan. 0.9	46.69 .30	30.2 2.6	31.70 .29	34.5 2.6	26.10 .27	61.8 2.0	55.49 .27	22.5 2.0	26.22 0.76	35.9 2.8
10.9	46.99 .31	27.6 2.3	31.99 .31	31.9 2.2	26.37 .30	59.8 1.9	55.76 .29	20.5 1.8	26.98 0.90	33.1 2.3
20.8	47.30 .33	25.3 1.8	32.30 .32	29.7 1.9	26.67 .30	57.9 1.7	56.05 .30	18.7 1.7	27.88 1.01	30.8 2.3
30.8	47.63 .33	23.5 1.4	32.62 .32	27.8 1.4	26.97 .30	56.2 1.5	56.35 .30	17.0 1.4	28.89 1.07	29.1 1.7
Feb. 9.8	47.96 .32	22.1 0.9	32.94 .32	26.4 1.0	27.27 .30	54.7 1.1	56.65 .30	15.6 1.2	29.96 1.10	28.0 1.1
19.7	48.28 .31	21.2 0.3	33.26 .31	25.4 0.4	27.57 .29	53.6 0.8	56.95 .29	14.4 0.8	31.06 1.09	27.5 0.5
Mar. 1.7	48.59 .29	20.9 0.2	33.57 .28	25.0 0.1	27.86 .27	52.8 0.4	57.24 .28	13.6 0.4	32.15 1.05	27.8 0.3
11.7	48.88 .26	21.1 0.7	33.85 .26	25.1 0.6	28.13 .25	52.4 0.0	57.52 .25	13.2 0.1	33.20 0.95	28.7 0.9
21.7	49.14 .23	21.8 1.2	34.11 .24	25.7 1.1	28.38 .23	52.4 0.3	57.77 .23	13.1 0.2	34.15 0.84	30.2 1.5
31.6	49.37 .20	23.0 1.6	34.35 .20	26.8 1.5	28.61 .20	52.7 0.6	58.00 .21	13.3 0.5	34.99 0.70	32.3 2.1
Apr. 10.6	49.57 .16	24.6 2.0	34.55 .17	28.3 1.8	28.81 .18	53.3 0.8	58.21 .18	13.8 0.8	35.69 0.53	34.8 2.5
20.6	49.73 .13	26.6 2.1	34.72 .13	30.1 2.1	28.99 .15	54.1 1.1	58.39 .15	14.6 1.0	36.22 0.36	37.6 2.8
30.6	49.86 .09	28.7 2.3	34.85 .10	32.2 2.1	29.14 .11	55.2 1.3	58.54 .13	15.6 1.1	36.58 0.17	40.8 3.2
May 10.5	49.95 .06	31.0 2.4	34.95 .07	34.4 2.2	29.25 .09	56.5 1.3	58.67 .10	16.7 1.3	36.75 0.01	44.0 3.2
20.5	50.01 .02	33.4 2.4	35.02 .03	36.7 2.3	29.34 .06	57.8 1.4	58.77 .07	18.0 1.3	36.74 0.19	47.3 3.3
30.5	50.03 .01	35.8 2.3	35.05 .00	39.0 2.3	29.40 .03	59.2 1.4	58.84 .03	19.3 1.3	36.55 0.36	50.5 3.2
June 9.4	50.02 .05	38.1 2.1	35.05 .03	41.3 2.1	29.43 .00	60.6 1.4	58.87 .01	20.6 1.3	36.19 0.52	53.5 3.0
19.4	49.97 .08	40.2 2.0	35.02 .07	43.4 1.9	29.43 .03	62.0 1.4	58.88 .03	21.9 1.3	35.67 0.67	56.3 2.8
29.4	49.89 .11	42.2 1.7	34.95 .10	45.3 1.6	29.40 .07	63.3 1.3	58.85 .06	23.2 1.1	35.00 0.79	58.7 2.4
July 9.4	49.78 .14	43.9 1.3	34.85 .13	46.9 1.4	29.33 .09	64.4 1.1	58.79 .09	24.3 1.1	34.21 0.91	60.7 2.0
19.3	49.64 .16	45.2 1.1	34.72 .15	48.3 1.1	29.24 .11	65.5 1.1	58.70 .11	25.3 1.0	33.30 0.99	62.3 1.6
29.3	49.48 .18	46.3 0.7	34.57 .17	49.4 0.8	29.13 .14	66.4 0.9	58.59 .13	26.1 0.8	32.31 1.05	63.4 1.1
Aug. 8.3	49.30 .19	47.0 0.3	34.40 .19	50.2 0.4	28.99 .16	67.1 0.7	58.46 .16	26.8 0.7	31.26 1.09	64.0 0.6
18.3	49.11 .20	47.3 0.1	34.21 .20	50.6 0.0	28.83 .16	67.6 0.5	58.30 .16	27.4 0.6	30.17 1.10	64.0 0.0
28.2	48.91 .20	47.2 0.4	34.01 .19	50.6 0.4	28.67 .17	67.9 0.3	58.14 .17	27.7 0.3	29.07 1.10	63.5 0.5
Sept. 7.2	48.71 .19	46.8 0.8	33.82 .19	50.2 0.7	28.50 .16	68.0 0.1	57.97 .16	27.8 0.0	27.97 1.06	62.5 1.0
17.2	48.52 .18	46.0 1.2	33.63 .17	49.5 1.1	28.34 .14	67.8 0.2	57.81 .15	27.8 0.3	26.91 0.99	61.1 1.4
27.1	48.34 .14	44.8 1.6	33.46 .14	48.4 1.4	28.20 .13	67.5 0.3	57.66 .13	27.5 0.3	25.92 0.90	59.1 2.0
Oct. 7.1	48.20 .11	43.2 1.9	33.32 .11	47.0 1.8	28.07 .09	66.9 0.6	57.53 .09	27.0 0.5	25.02 0.79	56.7 2.4
17.1	48.09 .07	41.3 2.3	33.21 .07	45.2 2.1	27.98 .05	66.0 0.9	57.44 .06	26.3 0.7	24.23 0.65	53.9 2.8
27.1	48.02 .01	39.0 2.5	33.14 .02	43.1 2.4	27.93 .01	64.9 1.1	57.38 .01	25.3 1.0	23.58 0.48	50.8 3.1
Nov. 6.0	48.01 .03	36.5 2.7	33.12 .03	40.7 2.6	27.92 .04	63.6 1.3	57.37 .03	24.1 1.2	23.10 0.31	47.4 3.4
16.0	48.04 .09	33.8 3.0	33.15 .08	38.1 2.8	27.96 .08	62.0 1.6	57.40 .09	22.6 1.5	22.79 0.11	43.8 3.6
26.0	48.13 .14	30.8 3.0	33.23 .14	35.3 2.8	28.04 .14	60.3 1.7	57.49 .13	21.0 1.6	22.68 0.09	40.1 3.7
Dec. 6.0	48.27 .20	27.8 3.0	33.37 .19	32.4 2.9	28.18 .19	58.3 2.0	57.62 .18	19.2 1.8	22.77 0.29	36.4 3.7
15.9	48.47 .24	24.8 2.9	33.56 .23	29.4 2.9	28.37 .22	56.3 2.0	57.80 .22	17.2 2.0	23.06 0.48	32.8 3.7
25.9	48.71 .27	21.9 2.9	33.79 .27	26.5 2.7	28.59 .26	54.2 2.1	58.02 .24	15.2 2.0	23.54 0.67	29.4 3.4
35.9	48.98	19.1 2.8	34.06	23.8 2.7	28.85	52.1 2.1	58.26	13.2 2.0	24.21	26.3 3.1

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	ε Coronæ Borealis.		δ Scorpii.		β¹ Scorpii.		φ Herculis.		δ¹ Apodis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	h m $\quad$ s $\quad$ 15 53	° ′ $\quad$ +27 09	h m $\quad$ s $\quad$ 15 54	° ′ $\quad$ −22 20	h m $\quad$ s $\quad$ 15 59	° ′ $\quad$ −19 32	h m $\quad$ s $\quad$ 16 05	° ′ $\quad$ +45 11	h m $\quad$ s $\quad$ 16 05	° ′ $\quad$ −78 26
Jan. 0.9	31.08 .27	37.7 2.6	32.04 .30	26.9 0.9	44.00 .29	7.3 0.9	39.61 .29	24.5 3.0	39.11 1.08	40.6 1.7
10.9	31.35 .29	35.1 2.4	32.34 .32	27.8 0.9	44.29 .31	8.2 1.0	39.90 .32	21.5 2.6	40.19 1.19	38.9 1.2
20.8	31.64 .32	32.7 2.0	32.66 .33	28.7 1.0	44.60 .32	9.2 1.1	40.22 .36	18.9 2.2	41.38 1.27	37.7 0.7
30.8	31.96 .32	30.7 1.5	32.99 .33	29.7 1.1	44.92 .32	10.3 1.1	40.58 .37	16.7 1.6	42.65 1.32	37.0 0.2
Feb. 9.8	32.28 .31	29.2 1.1	33.32 .32	30.8 1.1	45.24 .32	11.4 1.0	40.95 .37	15.1 1.0	43.97 1.34	36.8 0.3
19.8	32.59 .31	28.1 0.5	33.64 .32	31.9 1.0	45.56 .32	12.4 1.0	41.32 .37	14.1 0.4	45.31 1.32	37.1 0.8
Mar. 1.7	32.90 .30	27.6 0.0	33.96 .30	32.9 1.0	45.88 .30	13.4 0.9	41.69 .36	13.7 0.2	46.63 1.28	37.9 1.2
11.7	33.20 .27	27.6 0.5	34.26 .29	33.9 0.8	46.18 .28	14.3 0.8	42.05 .33	13.9 0.9	47.91 1.21	39.1 1.6
21.7	33.47 .25	28.1 1.0	34.55 .26	34.7 0.8	46.46 .26	15.1 0.6	42.38 .31	14.8 1.4	49.12 1.13	40.7 1.9
31.6	33.72 .22	29.1 1.4	34.81 .24	35.5 0.7	46.72 .23	15.7 0.5	42.69 .26	16.2 1.9	50.25 1.02	42.6 2.3
Apr. 10.6	33.94 .19	30.5 1.8	35.05 .21	36.2 0.5	46.95 .22	16.2 0.4	42.95 .23	18.1 2.3	51.27 0.90	44.9 2.6
20.6	34.13 .16	32.3 2.0	35.26 .19	36.7 0.5	47.17 .18	16.6 0.3	43.18 .19	20.4 2.7	52.17 .76	47.5 2.7
30.6	34.29 .13	34.3 2.3	35.45 .15	37.2 0.3	47.35 .16	16.9 0.2	43.37 .14	23.1 2.8	52.93 .61	50.2 2.9
May 10.5	34.42 .09	36.6 2.3	35.60 .13	37.5 0.3	47.51 .13	17.1 0.1	43.51 .09	25.9 3.0	53.54 .45	53.1 2.9
20.5	34.51 .05	38.9 2.4	35.73 .09	37.8 0.3	47.64 .10	17.2 0.0	43.60 .05	28.9 3.0	53.99 .28	56.1 3.0
30.5	34.56 .02	41.3 2.4	35.82 .06	38.1 0.1	47.74 .06	17.2 0.0	43.65 .00	31.9 3.0	54.27 .10	59.1 2.9
June 9.5	34.58 .02	43.7 2.2	35.88 .02	38.2 0.1	47.80 .03	17.2 0.0	43.65 .05	34.9 2.8	54.37 .08	62.0 2.9
19.4	34.56 .05	45.9 2.1	35.90 .01	38.3 0.1	47.83 .01	17.2 0.0	43.60 .09	37.7 2.5	54.29 .25	64.9 2.6
29.4	34.51 .09	48.0 1.8	35.89 .04	38.4 0.1	47.82 .04	17.1 0.2	43.51 .14	40.2 2.3	54.04 .42	67.5 2.3
July 9.4	34.42 .11	49.8 1.6	35.85 .08	38.3 0.0	47.78 .07	16.9 0.2	43.37 .17	42.5 1.9	53.62 .57	69.8 2.0
19.3	34.31 .15	51.4 1.2	35.77 .11	38.3 0.2	47.71 .11	16.7 0.2	43.20 .21	44.4 1.5	53.05 .71	71.8 1.6
29.3	34.16 .17	52.6 0.9	35.66 .14	38.1 0.3	47.60 .13	16.5 0.3	42.99 .24	45.9 1.1	52.34 .82	73.4 1.2
Aug. 8.3	33.99 .19	53.5 0.6	35.52 .16	37.8 0.3	47.47 .16	16.2 0.3	42.75 .26	47.0 0.6	51.52 .91	74.6 0.7
18.3	33.80 .20	54.1 0.2	35.36 .17	37.5 0.4	47.31 .17	15.9 0.4	42.49 .28	47.6 0.2	50.61 .96	75.3 0.1
28.2	33.60 .20	54.3 0.2	35.19 .18	37.1 0.5	47.14 .18	15.5 0.4	42.21 .28	47.8 0.3	49.65 .97	75.4 0.4
Sept. 7.2	33.40 .20	54.1 0.5	35.01 .17	36.6 0.5	46.96 .17	15.1 0.5	41.93 .28	47.5 0.8	48.68 .95	75.0 1.0
17.2	33.20 .19	53.6 0.9	34.84 .16	36.1 0.5	46.79 .16	14.6 0.4	41.65 .26	46.7 1.2	47.73 .89	74.0 1.5
27.2	33.01 .16	52.7 1.3	34.68 .14	35.6 0.6	46.63 .13	14.2 0.5	41.39 .24	45.5 1.7	46.84 .77	72.5 1.9
Oct. 7.1	32.85 .13	51.4 1.7	34.54 .10	35.0 0.5	46.50 .11	13.7 0.4	41.15 .20	43.8 2.2	46.07 .63	70.6 2.3
17.1	32.72 .09	49.7 2.0	34.44 .06	34.5 0.5	46.39 .06	13.3 0.3	40.95 .16	41.6 2.5	45.44 .46	68.3 2.6
27.1	32.63 .05	47.7 2.3	34.38 .02	34.0 0.3	46.33 .02	13.0 0.2	40.79 .11	39.1 2.8	44.98 .26	65.7 2.9
Nov. 6.0	32.58 .01	45.4 2.5	34.36 .02	33.7 0.2	46.31 .02	12.8 0.0	40.68 .04	36.3 3.2	44.72 .04	62.8 3.0
16.0	32.59 .06	42.9 2.8	34.40 .10	33.5 0.0	46.34 .03	12.8 0.1	40.64 .02	33.1 3.3	44.68 .18	59.8 2.9
26.0	32.65 .11	40.1 2.9	34.50 .14	33.5 0.1	46.43 .09	12.9 0.1	40.66 .08	29.8 3.3	44.86 .41	56.9 2.9
Dec. 6.0	32.76 .16	37.2 2.9	34.64 .20	33.6 0.4	46.57 .14	13.3 0.4	40.74 .15	26.3 3.5	45.27 .62	54.0 2.6
15.9	32.92 .21	34.3 2.9	34.84 .24	34.0 0.5	46.76 .23	13.8 0.7	40.89 .21	22.8 3.4	45.89 .81	51.4 2.3
25.9	33.13 .25	31.4 2.8	35.08 .28	34.5 0.8	46.99 .27	14.5 0.8	41.10 .26	19.4 3.2	46.70 .98	49.1 2.0
35.9	33.38	28.6	35.36	35.3	47.26	15.3	41.36	16.2	47.68	47.1

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 2320.		δ Ophiuchi.		σ Coronæ Borealis.		τ Herculis.		γ Apodis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	h m 16 05	° ' +68 03	h m 16 09	° ' − 3 26	h m 16 10	° ' +34 06	h m 16 16	° ' +46 32	h m 16 18	° ' −78 40
	s	"	s	"	s	"	s	"	s	"
Jan. 0.9	59.78 .43	57.8 3.1	12.21 .26	28.0 1.6	59.57 .26	21.3 2.9	46.30 .28	42.8 3.1	21.90 1.06	22.6 1.8
10.9	60.21 .52	54.7 2.6	12.47 .28	29.6 1.5	59.83 .29	18.4 2.5	46.58 .32	39.7 2.7	22.96 1.18	20.8 1.4
20.9	60.73 .57	52.1 2.1	12.75 .30	31.1 1.5	60.12 .32	15.9 2.1	46.90 .35	37.0 2.3	24.14 1.27	19.4 0.9
30.8	61.30 .61	50.0 1.4	13.05 .30	32.6 1.3	60.44 .33	13.8 1.7	47.25 .37	34.7 1.7	25.41 1.33	18.5 0.4
Feb. 9.8	61.91 .64	48.6 0.8	13.35 .30	33.9 1.1	60.77 .33	12.1 1.1	47.62 .38	33.0 1.1	26.74 1.36	18.1 0.1
19.8	62.55 .64	47.8 0.2	13.65 .30	35.0 0.9	61.10 .33	11.0 0.6	48.00 .38	31.9 0.5	28.10 1.36	18.2 0.5
Mar. 1.7	63.19 .61	47.6 0.6	13.95 .28	35.9 0.6	61.43 .31	10.4 0.0	48.38 .37	31.4 0.1	29.46 1.32	18.7 1.0
11.7	63.80 .58	48.2 1.2	14.23 .27	36.5 0.3	61.74 .30	10.4 0.6	48.75 .34	31.5 0.8	30.78 1.27	19.7 1.4
21.7	64.38 .51	49.4 1.8	14.50 .25	36.8 0.0	62.04 .27	11.0 1.1	49.09 .32	32.3 1.4	32.05 1.18	21.1 1.8
31.7	64.89 .45	51.2 2.3	14.75 .23	36.8 0.2	62.31 .25	12.1 1.6	49.41 .28	33.7 1.8	33.23 1.09	22.9 2.1
Apr. 10.6	65.34 .36	53.5 2.7	14.98 .20	36.6 0.4	62.56 .21	13.7 1.9	49.69 .25	35.5 2.3	34.32 0.96	25.0 2.4
20.6	65.70 .27	56.2 3.0	15.18 .18	36.2 0.6	62.77 .18	15.6 2.3	49.94 .20	37.8 2.7	35.28 0.83	27.4 2.7
30.6	65.97 .18	59.2 3.3	15.36 .15	35.6 0.7	62.95 .14	17.9 2.5	50.14 .16	40.5 2.9	36.11 0.68	30.1 2.8
May 10.5	66.15 .08	62.5 3.3	15.51 .12	34.9 0.9	63.09 .11	20.4 2.7	50.30 .10	43.4 3.0	36.79 0.52	32.9 2.9
20.5	66.23 .01	65.8 3.3	15.63 .10	34.0 0.9	63.20 .06	23.1 2.7	50.40 .06	46.4 3.1	37.31 0.34	35.8 3.0
30.5	66.22 .11	69.1 3.2	15.73 .06	33.1 1.0	63.26 .03	25.8 2.7	50.46 .01	49.5 3.0	37.65 0.16	38.8 2.9
June 9.5	66.11 .20	72.3 2.9	15.79 .03	32.1 0.9	63.29 .02	28.5 2.5	50.47 .04	52.5 2.9	37.81 0.02	41.7 2.9
19.4	65.91 .29	75.2 2.7	15.82 .00	31.2 0.9	63.27 .05	31.0 2.4	50.43 .09	55.4 2.6	37.79 0.20	44.6 2.6
29.4	65.62 .36	77.9 2.4	15.82 .04	30.3 0.9	63.22 .09	33.4 2.1	50.34 .13	58.0 2.4	37.59 0.38	47.2 2.5
July 9.4	65.26 .43	80.3 1.9	15.78 .07	29.4 0.7	63.13 .13	35.5 1.8	50.21 .17	60.4 2.0	37.21 0.54	49.7 2.1
19.4	64.83 .49	82.2 1.4	15.71 .10	28.7 0.7	63.00 .16	37.3 1.5	50.04 .21	62.4 1.7	36.67 0.69	51.8 1.7
29.3	64.34 .54	83.6 1.0	15.61 .13	28.0 0.6	62.84 .18	38.8 1.1	49.83 .25	64.1 1.2	35.98 0.82	53.5 1.3
Aug. 8.3	63.80 .57	84.6 0.5	15.48 .14	27.4 0.5	62.66 .21	39.9 0.7	49.58 .27	65.3 0.7	35.16 0.91	54.8 0.9
18.3	63.23 .59	85.1 0.1	15.34 .16	26.9 0.4	62.45 .23	40.6 0.3	49.31 .28	66.0 0.3	34.25 0.97	55.7 0.3
28.3	62.64 .59	85.0 0.6	15.18 .17	26.5 0.3	62.22 .23	40.9 0.1	49.03 .29	66.3 0.2	33.28 1.00	56.0 0.3
Sept. 7.2	62.05 .58	84.4 1.1	15.01 .17	26.2 0.1	61.99 .23	40.8 0.6	48.74 .30	65.1 0.6	32.28 0.99	55.7 0.8
17.2	61.47 .55	83.3 1.6	14.84 .16	26.1 0.0	61.76 .21	40.2 0.9	48.44 .28	65.5 1.2	31.29 0.93	54.9 1.3
27.2	60.92 .50	81.7 2.0	14.68 .14	26.1 0.1	61.55 .20	39.3 1.4	48.16 .25	64.3 1.6	30.36 0.83	53.6 1.8
Oct. 7.1	60.42 .45	79.7 2.6	14.54 .11	26.2 0.4	61.35 .16	37.9 1.8	47.91 .22	62.7 2.1	29.53 0.69	51.8 2.2
17.1	59.97 .37	77.1 2.9	14.43 .07	26.6 0.5	61.19 .13	36.1 2.1	47.69 .18	60.6 2.4	28.84 0.52	49.6 2.5
27.1	59.60 .28	74.2 3.2	14.36 .03	27.1 0.7	61.06 .08	34.0 2.5	47.51 .12	58.2 2.8	28.32 0.33	47.1 2.8
Nov. 6.1	59.32 .18	71.0 3.5	14.33 .01	27.8 0.7	60.98 .02	31.5 2.7	47.39 .07	55.4 3.1	27.99 0.10	44.3 2.8
16.0	59.14 .07	67.5 3.5	14.34 .07	28.7 0.9	60.96 .02	28.8 2.7	47.32 .00	52.3 3.1	27.89 0.10	41.3 3.0
26.0	59.07 .05	63.8 3.7	14.41 .07	29.8 1.1	60.99 .03	25.8 3.0	47.32 .00	48.9 3.4	28.01 0.12	38.3 3.0
Dec. 6.0	59.12 .16	60.1 3.7	14.53 .12	31.1 1.3	61.07 .08	22.7 3.1	47.39 .07	45.5 3.4	28.36 0.35	35.5 2.8
15.9	59.28 .28	56.4 3.6	14.69 .21	32.5 1.6	61.21 .19	19.5 3.2	47.52 .20	42.0 3.5	28.93 0.77	32.8 2.5
25.9	59.56 .37	52.8 3.3	14.90 .24	34.1 1.6	61.40 .24	16.3 3.0	47.72 .24	38.5 3.3	29.70 0.95	30.3 2.1
35.9	59.93	49.5	15.14	35.7	61.64	13.3	47.96	35.2	30.65	28.2

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Ursæ Minoris.		η Draconis.		α Scorpii. (Antares.)		β Herculis.		A Draconis.	
	Right Ascension.	Declination. North.	Right Ascension.	Declination. North.	Right Ascension.	Declination. South.	Right Ascension.	Declination. North.	Right Ascension.	Declination. North.
	h m 16 20	° ′ +75 58	h m 16 22	° ′ +61 43	h m 16 23	° ′ −26 12	h m 16 25	° ′ +21 41	h m 16 28	° ′ +68 58
	s	″	s	° ′	s	″	s	″	s	″
Jan. 0.9	15.79	46.0	37.21	63.6	23.53	44.2	59.68	69.9	6.56	43.0
10.9	16.35	42.9	37.55	60.4	23.81	44.7	59.92	67.4	6.96	39.8
20.9	17.04	40.2	37.95	57.6	24.12	45.3	60.19	65.1	7.44	37.0
30.8	17.84	38.1	38.41	55.3	24.45	46.0	60.48	63.0	8.00	34.7
Feb. 9.8	18.72	36.6	38.90	53.6	24.79	46.7	60.78	61.4	8.62	32.9
19.8	19.65	35.7	39.41	52.5	25.12	47.5	61.09	60.2	9.27	31.8
Mar. 1.8	20.60	35.5	39.93	52.1	25.45	48.3	61.39	59.4	9.93	31.4
11.7	21.52	35.9	40.43	52.4	25.77	49.1	61.68	59.1	10.57	31.7
21.7	22.40	37.0	40.91	53.3	26.08	49.9	61.96	59.4	11.19	32.7
31.7	23.19	38.7	41.35	54.9	26.37	50.6	62.22	60.1	11.76	34.2
Apr. 10.6	23.89	40.9	41.73	57.0	26.64	51.2	62.46	61.2	12.26	36.3
20.6	24.46	43.6	42.06	59.5	26.88	51.8	62.68	62.7	12.68	38.9
30.6	24.89	46.6	42.33	62.4	27.10	52.3	62.87	64.5	13.01	41.8
May 10.6	25.17	49.8	42.52	65.5	27.29	52.7	63.02	66.6	13.25	45.0
20.5	25.30	53.1	42.64	68.8	27.45	53.2	63.15	68.8	13.39	48.3
30.5	25.27	56.4	42.68	72.1	27.57	53.6	63.24	71.0	13.42	51.7
June 9.5	25.09	59.6	42.65	75.4	27.66	53.9	63.30	73.2	13.36	55.0
19.5	24.76	62.6	42.54	78.5	27.72	54.2	63.32	75.4	13.19	58.1
29.4	24.30	65.4	42.37	81.3	27.73	54.4	63.30	77.5	12.93	61.0
July 9.4	23.72	67.8	42.12	83.8	27.71	54.6	63.25	79.4	12.59	63.5
19.4	23.03	69.8	41.82	86.0	27.64	54.8	63.16	81.0	12.17	65.7
29.3	22.24	71.4	41.47	87.7	27.54	54.8	63.04	82.4	11.68	67.4
Aug. 8.3	21.38	72.5	41.08	88.9	27.41	54.8	62.90	83.5	11.13	68.7
18.3	20.47	73.1	40.65	89.7	27.25	54.6	62.73	84.3	10.54	69.5
28.3	19.52	73.2	40.20	90.0	27.08	54.4	62.54	84.8	9.92	69.7
Sept. 7.2	18.57	72.8	39.74	89.7	26.89	54.1	62.34	84.9	9.29	69.5
17.2	17.62	71.8	39.29	88.9	26.70	53.6	62.14	84.7	8.67	68.7
27.2	16.71	70.3	38.85	87.6	26.52	53.1	61.95	84.1	8.07	67.;
Oct. 7.2	15.87	68.4	38.44	85.8	26.36	52.5	61.78	83.2	7.50	65.6
17.1	15.10	66.0	38.08	83.5	26.23	51.9	61.63	81.9	6.99	63.3
27.1	14.45	63.2	37.77	80.8	26.14	51.3	61.52	80.4	6.55	60.6
Nov. 6.1	13.92	60.1	37.54	77.8	26.10	50.7	61.45	78.5	6.20	57.6
16.0	13.54	56.7	37.39	74.5	26.11	50.3	61.43	76.3	5.96	54.3
26.0	13.33	53.1	37.32	70.9	26.18	50.0	61.46	73.9	5.82	50.7
Dec. 6.0	13.28	49.4	37.35	67.2	26.30	49.8	61.54	71.3	5.80	47.0
16.0	13.41	45.8	37.47	63.5	26.48	49.8	61.67	68.6	5.91	43.3
25.9	13.71	42.2	37.68	59.9	26.70	50.0	61.85	65.9	6.13	39.6
35.9	14.18	38.9	37.97	56.5	26.96	50.3	62.07	63.2	6.46	36.2

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Ophiuchi. Right Ascension.	ζ Ophiuchi. Declination South.	α Triang. Australis. Right Ascension.	α Triang. Australis. Declination South.	η Herculis. Right Ascension.	η Herculis. Declination North.	κ Ophiuchi. Right Ascension.	κ Ophiuchi. Declination North.	ε Ursæ Minoris. Right Ascension.	ε Ursæ Minoris. Declination North.
	h m 16 31	° ′ −10 22	h m 16 38	° ′ −68 50	h m 16 39	° ′ +39 06	h m 16 53	° ′ + 9 31	h m 16 55	° ′ +82 11
	s	″	s	″	s	″	s	″	s	″
Jan. 0.9	45.33 (.25)	1.9 (1.2)	15.65 (.58)	38.3 (1.7)	30.97 (.24)	28.2 (3.0)	1.16 (.22)	40.7 (2.1)	48.07 (0.69)	53.7 (3.2)
10.9	45.58 (.27)	3.1 (1.2)	16.23 (.65)	36.6 (1.3)	31.21 (.28)	25.2 (2.8)	1.38 (.25)	38.6 (2.0)	48.76 (0.96)	50.5 (2.9)
20.9	45.85 (.30)	4.3 (1.1)	16.88 (.71)	35.3 (0.9)	31.49 (.31)	22.4 (2.3)	1.63 (.27)	36.6 (1.7)	49.72 (1.20)	47.6 (2.4)
30.8	46.15 (.30)	5.4 (1.1)	17.59 (.75)	34.4 (0.5)	31.80 (.33)	20.1 (1.9)	1.90 (.28)	34.9 (1.5)	50.92 (1.39)	45.2 (1.9)
Feb. 9.8	46.45 (.30)	6.5 (1.0)	18.34 (.76)	33.9 (0.1)	32.13 (.34)	18.2 (1.3)	2.18 (.29)	33.4 (1.2)	52.31 (1.53)	43.3 (1.3)
19.8	46.75 (.31)	7.5 (0.8)	19.10 (.77)	33.8 (0.3)	32.47 (.35)	16.9 (0.8)	2.47 (.29)	32.2 (0.8)	53.84 (1.62)	42.0 (0.6)
Mar. 1.8	47.06 (.29)	8.3 (0.6)	19.87 (.75)	34.1 (0.7)	32.82 (.34)	16.1 (0.2)	2.76 (.29)	31.4 (0.5)	55.46 (1.63)	41.4 (0.0)
11.7	47.35 (.28)	8.9 (0.4)	20.62 (.73)	34.8 (1.1)	33.16 (.32)	15.9 (0.5)	3.05 (.28)	30.9 (0.0)	57.09 (1.59)	41.4 (0.6)
21.7	47.63 (.27)	9.3 (0.2)	21.35 (.70)	35.9 (1.4)	33.48 (.30)	16.4 (1.0)	3.33 (.26)	30.9 (0.3)	58.68 (1.49)	42.0 (1.3)
31.7	47.90 (.24)	9.5 (0.0)	22.05 (.64)	37.3 (1.7)	33.78 (.28)	17.4 (1.6)	3.59 (.25)	31.2 (0.7)	60.17 (1.34)	43.3 (1.9)
Apr. 10.7	48.14 (.23)	9.5 (0.2)	22.69 (.59)	39.0 (1.9)	34.06 (.25)	19.0 (2.0)	3.84 (.23)	31.9 (1.1)	61.51 (1.15)	45.2 (2.3)
20.6	48.37 (.20)	9.3 (0.3)	23.28 (.52)	40.9 (2.2)	34.31 (.22)	21.0 (2.4)	4.07 (.21)	33.0 (1.3)	62.66 (0.93)	47.5 (2.7)
30.6	48.57 (.18)	9.0 (0.5)	23.80 (.45)	43.1 (2.4)	34.53 (.17)	23.4 (2.6)	4.28 (.19)	34.3 (1.5)	63.59 (0.66)	50.2 (3.0)
May 10.6	48.75 (.15)	8.5 (0.5)	24.25 (.36)	45.5 (2.5)	34.70 (.14)	26.0 (2.8)	4.47 (.15)	35.8 (1.6)	64.25 (0.40)	53.2 (3.2)
20.5	48.90 (.12)	8.0 (0.6)	24.61 (.27)	48.0 (2.5)	34.84 (.09)	28.8 (2.9)	4.62 (.12)	37.4 (1.7)	64.65 (0.11)	56.4 (3.3)
30.5	49.02 (.09)	7.4 (0.6)	24.88 (.18)	50.5 (2.5)	34.93 (.05)	31.7 (2.9)	4.74 (.10)	39.1 (1.8)	64.76 (0.17)	59.7 (3.2)
June 9.5	49.11 (.05)	6.8 (0.6)	25.06 (.08)	53.0 (2.5)	34.98 (.01)	34.6 (2.9)	4.84 (.05)	40.9 (1.7)	64.59 (0.44)	62.9 (3.2)
19.5	49.16 (.02)	6.2 (0.6)	25.14 (.02)	55.5 (2.4)	34.99 (.04)	37.5 (2.6)	4.89 (.02)	42.6 (1.7)	64.15 (0.70)	66.1 (2.9)
29.5	49.18 (.02)	5.6 (0.6)	25.12 (.12)	57.9 (2.2)	34.95 (.08)	40.1 (2.5)	4.91 (.01)	44.3 (1.5)	63.45 (0.94)	69.0 (2.7)
July 9.4	49.16 (.05)	5.0 (0.5)	25.00 (.21)	60.1 (2.0)	34.87 (.12)	42.6 (2.1)	4.90 (.05)	45.8 (1.4)	62.51 (1.17)	71.7 (2.3)
19.4	49.11 (.09)	4.5 (0.5)	24.79 (.31)	62.1 (1.6)	34.75 (.16)	44.7 (1.8)	4.85 (.09)	47.2 (1.2)	61.34 (1.35)	74.0 (2.0)
29.4	49.02 (.11)	4.0 (0.5)	24.48 (.39)	63.7 (1.3)	34.59 (.20)	46.5 (1.4)	4.76 (.12)	48.4 (1.0)	59.99 (1.51)	76.0 (1.5)
Aug. 8.3	48.91 (.15)	3.5 (0.4)	24.09 (.45)	65.0 (0.9)	34.39 (.22)	47.9 (1.0)	4.64 (.14)	49.4 (0.8)	58.48 (1.63)	77.5 (1.0)
18.3	48.76 (.16)	3.1 (0.3)	23.64 (.49)	65.9 (0.4)	34.17 (.24)	48.9 (0.6)	4.50 (.17)	50.2 (0.6)	56.85 (1.73)	78.5 (0.6)
28.3	48.60 (.17)	2.8 (0.3)	23.15 (.52)	66.3 (0.1)	33.93 (.26)	49.5 (0.1)	4.33 (.18)	50.8 (0.3)	55.12 (1.77)	79.1 (0.1)
Sept. 7.2	48.43 (.17)	2.5 (0.3)	22.63 (.53)	66.2 (0.5)	33.67 (.26)	49.6 (0.3)	4.15 (.18)	51.1 (0.1)	53.35 (1.79)	79.2 (0.5)
17.2	48.26 (.17)	2.2 (0.1)	22.10 (.51)	65.7 (1.0)	33.41 (.25)	49.3 (0.8)	3.97 (.18)	51.2 (0.2)	51.56 (1.76)	78.7 (0.9)
27.2	48.09 (.15)	2.1 (0.1)	21.59 (.46)	64.7 (1.5)	33.16 (.23)	48.5 (1.2)	3.79 (.17)	51.0 (0.5)	49.80 (1.68)	77.8 (1.5)
Oct. 7.2	47.94 (.13)	2.0 (0.0)	21.13 (.39)	63.2 (1.8)	32.93 (.21)	47.3 (1.7)	3.62 (.15)	50.5 (0.7)	48.12 (1.56)	76.3 (1.9)
17.1	47.81 (.09)	2.0 (0.2)	20.74 (.30)	61.4 (2.2)	32.72 (.17)	45.6 (2.1)	3.47 (.12)	49.8 (1.0)	46.56 (1.41)	74.4 (2.3)
27.1	47.72 (.04)	2.2 (0.3)	20.44 (.19)	59.2 (2.4)	32.55 (.12)	43.5 (2.4)	3.35 (.07)	48.8 (1.2)	45.15 (1.22)	72.1 (2.7)
Nov. 6.1	47.68 (.01)	2.5 (0.4)	20.25 (.08)	56.8 (2.6)	32.43 (.07)	41.1 (2.8)	3.28 (.04)	47.6 (1.5)	43.93 (0.98)	69.4 (3.1)
16.1	47.67 (.05)	2.9 (0.7)	20.17 (.05)	54.2 (2.6)	32.36 (.01)	38.3 (3.0)	3.24 (.02)	46.1 (1.7)	42.95 (0.71)	66.3 (3.3)
26.0	47.72 (.10)	3.6 (0.8)	20.22 (.18)	51.6 (2.6)	32.35 (.05)	35.3 (3.2)	3.26 (.06)	44.4 (1.9)	42.24 (0.42)	63.0 (3.5)
Dec. 6.0	47.82 (.15)	4.4 (0.9)	20.40 (.30)	49.0 (2.4)	32.40 (.10)	32.1 (3.3)	3.32 (.11)	42.5 (2.1)	41.82 (0.11)	59.5 (3.5)
16.0	47.97 (.19)	5.3 (1.1)	20.70 (.42)	46.6 (2.2)	32.50 (.16)	28.8 (3.3)	3.43 (.16)	40.4 (2.1)	41.71 (0.20)	56.0 (3.6)
25.9	48.16 (.23)	6.4 (1.2)	21.12 (.52)	44.4 (1.9)	32.66 (.21)	25.5 (3.2)	3.59 (.19)	38.3 (2.1)	41.91 (0.51)	52.4 (3.3)
35.9	48.39	7.6	21.64	42.5	32.87	22.3	3.78	36.2	42.42	49.1

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	d Herculis. Right Ascension.	d Herculis. Declination North.	η Ophiuchi. Right Ascension.	η Ophiuchi. Declination South.	a¹ Herculis. Right Ascension.	a¹ Herculis. Declination North.	π Herculis. Right Ascension.	π Herculis. Declination North.	θ Ophiuchi. Right Ascension.	θ Ophiuchi. Declination South.
	h m 16 57	° +33 42	h m 17 04	° ′ −15 36	h m 17 10	° ′ +14 29	h m 17 11	° ′ +36 54	h m 17 15	° ′ −24 53
	s	″	s	″	s	″	s	″	s	″
Jan. 0.9	58.19 (.22)	35.6 (2.9)	44.95 (.23)	6.4 (0.8)	10.04 (.20)	69.4 (2.2)	36.83 (.20)	70.5 (3.1)	58.91 (.24)	58.6 (0.2)
10.9	58.41 (.25)	32.7 (2.7)	45.18 (.26)	7.2 (0.8)	10.24 (.23)	67.2 (2.2)	37.03 (.25)	67.4 (2.8)	59.15 (.27)	58.8 (0.3)
20.9	58.66 (.29)	30.0 (2.4)	45.44 (.28)	8.0 (0.8)	10.47 (.26)	65.0 (1.9)	37.28 (.28)	64.6 (2.5)	59.42 (.29)	59.1 (0.3)
30.9	58.95 (.30)	27.6 (2.0)	45.72 (.30)	8.8 (0.8)	10.73 (.28)	63.1 (1.6)	37.56 (.30)	62.1 (2.1)	59.71 (.31)	59.4 (0.4)
Feb. 9.8	59.25 (.32)	25.6 (1.4)	46.02 (.30)	9.6 (0.7)	11.01 (.28)	61.5 (1.3)	37.86 (.32)	60.0 (1.5)	60.02 (.32)	59.8 (0.4)
19.8	59.57 (.32)	24.2 (0.9)	46.32 (.31)	10.3 (0.6)	11.29 (.30)	60.2 (0.9)	38.18 (.33)	58.5 (1.0)	60.34 (.32)	60.2 (0.4)
Mar. 1.8	59.89 (.33)	23.3 (0.3)	46.63 (.30)	10.9 (0.4)	11.59 (.29)	59.3 (0.4)	38.51 (.33)	57.5 (0.4)	60.66 (.32)	60.6 (0.4)
11.8	60.22 (.31)	23.0 (0.2)	46.93 (.30)	11.3 (0.3)	11.88 (.28)	58.9 (0.0)	38.84 (.33)	57.1 (0.2)	60.98 (.32)	61.0 (0.4)
21.7	60.53 (.30)	23.2 (0.8)	47.23 (.28)	11.6 (0.2)	12.16 (.28)	58.9 (0.4)	39.17 (.31)	57.3 (0.7)	61.30 (.32)	61.3 (0.3)
31.7	60.83 (.28)	24.0 (1.4)	47.51 (.27)	11.8 (0.0)	12.44 (.26)	59.3 (0.8)	39.48 (.29)	58.0 (1.3)	61.61 (.31)	61.6 (0.3)
Apr. 10.7	61.11 (.25)	25.4 (1.8)	47.78 (.26)	11.8 (0.1)	12.70 (.24)	60.1 (1.2)	39.77 (.27)	59.3 (1.8)	61.90 (.28)	61.8 (0.2)
20.6	61.36 (.22)	27.2 (2.1)	48.04 (.23)	11.7 (0.2)	12.94 (.22)	61.3 (1.5)	40.04 (.24)	61.1 (2.2)	62.18 (.26)	62.0 (0.2)
30.6	61.58 (.19)	29.3 (2.4)	48.27 (.22)	11.5 (0.3)	13.16 (.20)	62.8 (1.7)	40.28 (.21)	63.3 (2.5)	62.44 (.24)	62.1 (0.1)
May 10.6	61.77 (.16)	31.7 (2.7)	48.49 (.18)	11.2 (0.3)	13.36 (.17)	64.5 (1.9)	40.49 (.18)	65.8 (2.7)	62.68 (.21)	62.2 (0.1)
20.6	61.93 (.12)	34.4 (2.8)	48.67 (.16)	10.9 (0.4)	13.53 (.14)	66.4 (2.0)	40.67 (.13)	68.5 (2.9)	62.89 (.18)	62.3 (0.1)
30.5	62.05 (.08)	37.2 (2.8)	48.83 (.12)	10.5 (0.4)	13.67 (.10)	68.4 (2.1)	40.80 (.09)	71.4 (3.0)	63.07 (.14)	62.4 (0.1)
June 9.5	62.13 (.03)	40.0 (2.7)	48.95 (.09)	10.1 (0.4)	13.77 (.07)	70.5 (2.0)	40.89 (.04)	74.4 (2.9)	63.21 (.10)	62.5 (0.1)
19.5	62.16 (.01)	42.7 (2.6)	49.04 (.05)	9.7 (0.4)	13.84 (.03)	72.5 (2.0)	40.93 (.00)	77.3 (2.7)	63.31 (.07)	62.6 (0.2)
29.5	62.15 (.05)	45.3 (2.5)	49.09 (.01)	9.3 (0.4)	13.87 (.01)	74.5 (1.8)	40.93 (.04)	80.0 (2.6)	63.38 (.02)	62.8 (0.2)
July 9.4	62.10 (.09)	47.8 (2.1)	49.10 (.03)	8.9 (0.3)	13.86 (.04)	76.3 (1.6)	40.89 (.09)	82.6 (2.4)	63.40 (.02)	63.0 (0.1)
19.4	62.01 (.13)	49.9 (1.9)	49.07 (.07)	8.6 (0.3)	13.82 (.08)	77.9 (1.5)	40.80 (.13)	85.0 (2.0)	63.38 (.06)	63.1 (0.1)
29.4	61.88 (.16)	51.8 (1.5)	49.00 (.10)	8.3 (0.2)	13.74 (.12)	79.4 (1.2)	40.67 (.17)	87.0 (1.7)	63.32 (.10)	63.2 (0.1)
Aug. 8.3	61.72 (.19)	53.3 (1.2)	48.90 (.13)	8.1 (0.3)	13.62 (.14)	80.6 (1.0)	40.50 (.20)	88.7 (1.3)	63.22 (.14)	63.3 (0.1)
18.3	61.53 (.22)	54.5 (0.7)	48.77 (.16)	7.8 (0.2)	13.48 (.17)	81.6 (0.7)	40.30 (.23)	90.0 (0.9)	63.08 (.16)	63.4 (0.0)
28.3	61.31 (.23)	55.2 (0.4)	48.61 (.17)	7.6 (0.2)	13.31 (.18)	82.3 (0.4)	40.07 (.24)	90.9 (0.5)	62.92 (.18)	63.4 (0.1)
Sept. 7.3	61.08 (.24)	55.6 (0.1)	48.44 (.19)	7.4 (0.2)	13.13 (.20)	82.7 (0.1)	39.83 (.25)	91.4 (0.0)	62.74 (.20)	63.3 (0.2)
17.2	60.84 (.24)	55.5 (0.5)	48.25 (.18)	7.2 (0.2)	12.93 (.19)	82.8 (0.2)	39.58 (.26)	91.4 (0.4)	62.54 (.19)	63.1 (0.3)
27.2	60.60 (.22)	55.0 (1.0)	48.07 (.16)	7.0 (0.2)	12.74 (.18)	82.6 (0.5)	39.32 (.24)	91.0 (0.8)	62.35 (.18)	62.8 (0.3)
Oct. 7.2	60.38 (.20)	54.0 (1.4)	47.91 (.15)	6.8 (0.2)	12.56 (.16)	82.1 (0.8)	39.08 (.22)	90.2 (1.4)	62.17 (.16)	62.5 (0.3)
17.2	60.18 (.17)	52.6 (1.7)	47.76 (.12)	6.7 (0.1)	12.40 (.13)	81.3 (1.1)	38.86 (.18)	88.8 (1.7)	62.01 (.13)	62.2 (0.4)
27.1	60.01 (.12)	50.9 (2.2)	47.64 (.07)	6.6 (0.1)	12.27 (.10)	80.2 (1.4)	38.68 (.15)	87.1 (2.1)	61.88 (.09)	61.8 (0.4)
Nov. 6.1	59.89 (.08)	48.7 (2.4)	47.57 (.03)	6.7 (0.1)	12.17 (.05)	78.8 (1.6)	38.53 (.10)	85.0 (2.5)	61.79 (.04)	61.4 (0.4)
16.1	59.81 (.02)	46.3 (2.8)	47.54 (.02)	6.8 (0.1)	12.12 (.01)	77.2 (1.9)	38.43 (.05)	82.5 (2.8)	61.75 (.01)	61.0 (0.3)
26.0	59.79 (.03)	43.5 (2.9)	47.56 (.07)	7.0 (0.4)	12.11 (.04)	75.3 (2.1)	38.38 (.01)	79.7 (3.0)	61.76 (.06)	60.7 (0.2)
Dec. 6.0	59.82 (.09)	40.6 (3.1)	47.63 (.12)	7.4 (0.6)	12.15 (.09)	73.2 (2.2)	38.39 (.07)	76.7 (3.2)	61.82 (.12)	60.5 (0.1)
16.0	59.91 (.14)	37.5 (3.2)	47.75 (.17)	8.0 (0.6)	12.24 (.14)	71.0 (2.4)	38.46 (.12)	73.5 (3.2)	61.94 (.17)	60.4 (0.0)
26.0	60.05 (.19)	34.3 (3.0)	47.92 (.20)	8.6 (0.7)	12.38 (.18)	68.6 (2.3)	38.58 (.18)	70.3 (3.2)	62.11 (.21)	60.4 (0.1)
35.9	60.24	31.3	48.12	9.3	12.56	66.3	38.76	67.1	62.32	60.5

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	b Ophiuchi. Right Ascension.	b Ophiuchi. Declination South.	δ Aræ. Right Ascension.	δ Aræ. Declination South.	β Draconis. Right Ascension.	β Draconis. Declination North.	α Ophiuchi. Right Ascension.	α Ophiuchi. Declination North.	ι Herculis. Right Ascension.	ι Herculis. Declination North.
	h m 17 20	° ′ −24 04	h m 17 22	° ′ −60 35	h m 17 28	° ′ +52 22	h m 17 30	° ′ +12 37	h m 17 36	° ′ +46 03
	s	″	s	″	s	″	s	″	s	″
Jan. 1.0	22.54 .23	59.4 0.2	13.78 .38	57.1 1.8	11.19 .20	26.7 3.4	22.41 .19	56.1 2.2	40.39 .18	32.1 3.3
10.9	22.77 .26	59.6 0.3	14.16 .44	55.3 1.5	11.39 .26	23.3 3.1	22.60 .22	53.9 2.0	40.57 .23	28.8 3.1
20.9	23.03 .29	59.9 0.4	14.60 .49	53.8 1.2	11.65 .30	20.2 2.8	22.82 .24	51.9 1.9	40.80 .27	25.7 2.7
30.9	23.32 .31	60.3 0.4	15.09 .53	52.6 0.9	11.95 .35	17.4 2.3	23.06 .27	50.0 1.6	41.07 .32	23.0 2.4
Feb. 9.8	23.63 .31	60.7 0.4	15.62 .56	51.7 0.6	12.30 .38	15.1 1.8	23.33 .28	48.4 1.3	41.39 .34	20.6 1.8
19.8	23.94 .33	61.1 0.4	16.18 .57	51.1 0.2	12.68 .40	13.3 1.2	23.61 .28	47.1 0.9	41.73 .35	18.8 1.3
Mar. 1.8	24.27 .32	61.5 0.3	16.75 .57	50.9 0.1	13.08 .41	12.1 0.6	23.89 .29	46.2 0.5	42.08 .37	17.5 0.6
11.8	24.59 .31	61.8 0.3	17.32 .56	51.0 0.4	13.49 .41	11.5 0.1	24.18 .29	45.7 0.1	42.45 .37	16.9 0.0
21.7	24.90 .31	62.1 0.2	17.88 .55	51.4 0.6	13.90 .39	11.6 0.8	24.47 .28	45.6 0.4	42.82 .36	16.9 0.7
31.7	25.21 .30	62.3 0.2	18.43 .53	52.0 1.0	14.29 .38	12.4 1.4	24.75 .27	46.0 0.7	43.18 .34	17.6 1.2
Apr. 10.7	25.51 .28	62.5 0.1	18.96 .50	53.0 1.2	14.67 .34	13.8 1.9	25.02 .25	46.7 1.1	43.52 .31	18.8 1.8
20.7	25.79 .26	62.6 0.1	19.46 .46	54.2 1.4	15.01 .30	15.7 2.4	25.27 .23	47.8 1.4	43.83 .29	20.6 2.2
30.6	26.05 .23	62.7 0.0	19.92 .41	55.6 1.7	15.31 .26	18.1 2.8	25.50 .22	49.2 1.7	44.12 .25	22.8 2.7
May 10.6	26.28 .21	62.7 0.0	20.33 .36	57.3 1.8	15.57 .21	20.9 3.0	25.72 .18	50.9 1.8	44.37 .21	25.5 2.9
20.6	26.49 .18	62.7 0.1	20.69 .30	59.1 2.0	15.78 .16	23.9 3.2	25.90 .16	52.7 2.0	44.58 .17	28.4 3.1
30.5	26.67 .15	62.8 0.0	20.99 .23	61.1 2.0	15.94 .10	27.1 3.4	26.06 .13	54.7 2.0	44.75 .11	31.5 3.2
June 9.5	26.82 .11	62.8 0.1	21.22 .16	63.1 2.1	16.04 .04	30.5 3.2	26.19 .09	56.7 2.0	44.86 .06	34.7 3.2
19.5	26.93 .07	62.9 0.1	21.38 .09	65.2 2.0	16.08 .02	33.7 3.2	26.28 .05	58.7 1.9	44.92 .01	37.9 3.1
29.5	27.00 .03	63.0 0.1	21.47 .01	67.2 2.0	16.06 .08	36.9 3.0	26.33 .01	60.6 1.8	44.93 .04	41.0 3.0
July 9.4	27.03 .02	63.1 0.1	21.48 .07	69.2 1.9	15.98 .14	39.9 2.8	26.34 .02	62.4 1.7	44.89 .10	44.0 2.7
19.4	27.01 .06	63.2 0.1	21.41 .15	71.1 1.7	15.84 .19	42.7 2.4	26.32 .07	64.1 1.4	44.79 .15	46.7 2.4
29.4	26.95 .10	63.3 0.1	21.26 .22	72.8 1.4	15.65 .24	45.1 2.0	26.25 .10	65.5 1.3	44.64 .19	49.1 2.0
Aug. 8.4	26.85 .13	63.4 0.1	21.04 .28	74.2 1.2	15.41 .28	47.1 1.6	26.15 .13	66.8 1.0	44.45 .23	51.1 1.7
18.3	26.72 .16	63.4 0.0	20.76 .32	75.4 0.7	15.13 .32	48.7 1.2	26.02 .16	67.8 0.8	44.22 .26	52.8 1.2
28.3	26.56 .18	63.4 0.0	20.44 .37	76.1 0.4	14.81 .34	49.9 0.7	25.86 .18	68.6 0.4	43.96 .29	54.0 0.8
Sept. 7.3	26.38 .19	63.3 0.1	20.07 .38	76.5 0.0	14.47 .35	50.6 0.2	25.68 .19	69.0 0.2	43.67 .30	54.8 0.3
17.2	26.19 .20	63.2 0.2	19.69 .38	76.5 0.4	14.12 .36	50.8 0.4	25.49 .19	69.2 0.2	43.37 .31	55.1 0.2
27.2	25.99 .18	63.0 0.3	19.31 .36	76.1 0.9	13.76 .35	50.4 0.8	25.30 .19	69.2 0.0	43.06 .30	54.9 0.7
Oct. 7.2	25.81 .16	62.7 0.3	18.95 .33	75.2 1.2	13.41 .32	49.6 1.4	25.11 .17	68.8 0.4	42.76 .28	54.2 1.2
17.2	25.65 .13	62.4 0.4	18.62 .27	74.0 1.6	13.09 .29	48.2 1.8	24.94 .14	68.2 0.6	42.48 .25	53.0 1.6
27.1	25.52 .09	62.0 0.3	18.35 .20	72.4 1.8	12.80 .24	46.4 2.3	24.80 .10	67.2 1.2	42.23 .21	51.4 2.1
Nov. 6.1	25.43 .05	61.7 0.3	18.15 .12	70.6 2.1	12.56 .19	44.1 2.6	24.70 .07	66.0 1.5	42.02 .16	49.3 2.5
16.1	25.38 .01	61.4 0.3	18.03 .03	68.5 2.2	12.37 .12	41.5 3.1	24.63 .03	64.5 1.7	41.86 .11	46.8 2.9
26.1	25.39 .06	61.1 0.3	18.00 .07	66.3 2.2	12.25 .06	38.4 3.3	24.60 .03	62.8 2.0	41.75 .04	43.9 3.1
Dec. 6.0	25.45 .11	61.0 0.1	18.07 .16	64.1 2.2	12.19 .02	35.1 3.5	24.63 .07	60.8 2.1	41.71 .02	40.8 3.3
16.0	25.56 .16	60.9 0.1	18.23 .24	61.9 2.1	12.21 .09	31.6 3.5	24.70 .12	58.7 2.2	41.73 .08	37.5 3.4
26.0	25.72 .20	61.0 0.1	18.47 .33	59.8 1.9	12.30 .16	28.1 3.5	24.82 .16	56.5 2.2	41.81 .15	34.1 3.4
35.9	25.92	61.1	18.80	57.9	12.46	24.6	24.98	54.3	41.96	30.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ω Draconis. Right Ascension.	Declination North.	μ Herculis. Right Ascension.	Declination North.	ψ¹ Draconis. Right Ascension.	Declination North.	θ Herculis. Right Ascension.	Declination North.	γ Draconis. Right Ascension.	Declination North.
	h m 17 37	° ' +68 47	h m 17 42	° ' +27 46	h m 17 43	° ' +72 11	h m 17 52	° ' +37 15	h m 17 54	° ' +51 29
	s	"	s	"	s	"	s	"	s	"
Jan. 1.0	27.62 .23	73.3 3.5	36.42 .17	43.6 2.8	36.10 .23	51.4 3.5	52.32 .16	51.7 3.1	18.00 .16	64.4 3.4
10.9	27.85 .33	69.8 3.3	36.59 .21	40.8 2.6	36.33 .35	47.9 3.3	52.48 .20	48.6 3.0	18.16 .22	61.0 3.2
20.9	28.18 .43	66.5 2.9	36.80 .24	38.2 2.4	36.68 .47	44.6 2.9	52.68 .24	45.6 2.7	18.38 .27	57.8 3.0
30.9	28.61 .51	63.6 2.4	37.04 .26	35.8 2.1	37.15 .58	41.7 2.5	52.92 .28	42.9 2.2	18.65 .32	54.8 2.5
Feb. 9.9	29.12 .57	61.2 1.9	37.30 .29	33.7 1.6	37.73 .65	39.2 2.0	53.20 .30	40.7 1.9	18.97 .35	52.3 2.0
19.8	29.69 .62	59.3 1.3	37.59 .30	32.1 1.2	38.38 .71	37.2 1.3	53.50 .31	38.8 1.3	19.32 .38	50.3 1.5
Mar. 1.8	30.31 .64	58.0 0.6	37.89 .30	30.9 0.6	39.09 .75	35.9 0.7	53.81 .33	37.5 0.7	19.70 .40	48.8 0.8
11.8	30.95 .64	57.4 0.1	38.19 .30	30.3 0.1	39.84 .75	35.2 0.0	54.14 .33	36.8 0.2	20.10 .40	48.0 0.1
21.7	31.59 .63	57.5 0.7	38.49 .30	30.2 0.4	40.59 .73	35.2 0.6	54.47 .33	36.6 0.5	20.50 .40	47.9 0.5
31.7	32.22 .60	58.2 1.4	38.79 .29	30.6 1.0	41.32 .70	35.8 1.3	54.80 .31	37.1 1.0	20.90 .38	48.4 1.1
Apr. 10.7	32.82 .54	59.6 2.0	39.08 .27	31.6 1.4	42.02 .64	37.1 1.9	55.11 .30	38.1 1.6	21.28 .36	49.5 1.7
20.7	33.36 .47	61.6 2.4	39.35 .26	33.0 1.8	42.66 .56	39.0 2.3	55.41 .27	39.7 2.0	21.64 .32	51.2 2.2
30.6	33.83 .39	64.0 2.8	39.61 .22	34.8 2.2	43.22 .47	41.3 2.8	55.68 .25	41.7 2.4	21.96 .29	53.4 2.6
May 10.6	34.22 .31	66.8 3.2	39.83 .20	37.0 2.4	43.69 .36	44.1 3.1	55.93 .22	44.1 2.6	22.25 .25	56.0 2.9
20.6	34.53 .21	70.0 3.3	40.03 .16	39.4 2.6	44.05 .24	47.2 3.3	56.15 .17	46.7 2.9	22.50 .19	58.9 3.2
30.6	34.74 .11	73.3 3.4	40.19 .13	42.0 2.6	44.29 .13	50.5 3.4	56.32 .14	49.6 3.0	22.69 .14	62.1 3.3
June 9.5	34.85 .00	76.7 3.4	40.32 .09	44.6 2.7	44.42 .00	53.9 3.4	56.46 .09	52.6 3.0	22.83 .07	65.4 3.3
19.5	34.85 .09	80.1 3.4	40.41 .05	47.3 2.6	44.42 .11	57.3 3.3	56.55 .05	55.6 3.0	22.90 .02	68.7 3.3
29.5	34.76 .20	83.5 3.1	40.46 .00	49.9 2.4	44.31 .24	60.6 3.2	56.60 .01	58.6 2.8	22.92 .04	72.0 3.1
July 9.4	34.56 .29	86.6 2.9	40.46 .04	52.3 2.3	44.07 .35	63.8 2.9	56.59 .05	61.4 2.6	22.88 .10	75.1 2.9
19.4	34.27 .38	89.5 2.6	40.42 .08	54.6 2.0	43.72 .45	66.7 2.6	56.54 .09	64.0 2.4	22.78 .15	78.0 2.7
29.4	33.89 .46	92.1 2.2	40.34 .12	56.6 1.7	43.27 .55	69.3 2.3	56.45 .14	66.4 2.1	22.63 .21	80.7 2.3
Aug. 8.4	33.43 .52	94.3 1.7	40.22 .16	58.3 1.5	42.72 .62	71.6 1.8	56.31 .18	68.5 1.7	22.42 .26	83.0 1.9
18.3	32.91 .58	96.0 1.3	40.06 .18	59.8 1.0	42.10 .69	73.4 1.3	56.13 .21	70.2 1.3	22.16 .29	84.9 1.5
28.3	32.33 .62	97.3 0.8	39.88 .21	60.8 0.7	41.41 .74	74.7 0.9	55.92 .24	71.5 0.9	21.87 .32	86.4 1.0
Sept. 7.3	31.71 .64	98.1 0.3	39.67 .22	61.5 0.3	40.67 .77	75.6 0.3	55.68 .25	72.4 0.5	21.55 .35	87.4 0.5
17.3	31.07 .64	98.4 0.2	39.45 .23	61.8 0.1	39.90 .77	75.9 0.3	55.43 .26	72.9 0.0	21.20 .35	87.9 0.0
27.2	30.43 .64	98.2 0.8	39.22 .22	61.7 0.4	39.13 .77	75.8 0.1	55.17 .26	72.9 0.5	20.85 .34	87.9 0.5
Oct. 7.2	29.79 .60	97.4 1.3	39.00 .20	61.3 0.9	38.36 .73	75.1 0.7	54.91 .24	72.4 0.9	20.51 .33	87.4 1.0
17.2	29.19 .55	96.1 1.8	38.80 .18	60.4 1.3	37.63 .67	73.8 1.3	54.67 .21	71.5 1.3	20.18 .31	86.4 1.5
27.1	28.64 .49	94.3 2.3	38.62 .15	59.1 1.7	36.96 .61	72.1 2.2	54.46 .18	70.2 1.8	19.87 .26	84.9 2.0
Nov. 6.1	28.15 .40	92.0 2.7	38.47 .10	57.4 2.0	36.35 .50	69.9 2.7	54.28 .14	68.4 2.2	19.61 .21	82.9 2.4
16.1	27.75 .31	89.3 3.1	38.37 .06	55.4 2.3	35.85 .40	67.2 3.0	54.14 .09	66.2 2.5	19.40 .15	80.5 2.8
26.1	27.44 .20	86.2 3.3	38.31 .01	53.1 2.5	35.45 .28	64.2 3.3	54.05 .04	63.7 2.8	19.25 .09	77.7 3.1
Dec. 6.0	27.24 .08	82.9 3.6	38.30 .05	50.6 2.8	35.17 .14	60.9 3.5	54.01 .01	60.9 3.0	19.16 .02	74.6 3.4
16.0	27.16 .03	79.3 3.6	38.35 .09	47.8 2.9	35.03 .00	57.4 3.6	54.02 .08	57.9 3.2	19.14 .05	71.2 3.4
26.0	27.19 .16	75.7 3.6	38.44 .14	44.9 2.8	35.03 .14	53.8 3.6	54.10 .12	54.7 3.1	19.19 .11	67.8 3.5
36.0	27.35	72.1	38.58	42.1	35.17	50.2	54.22	51.6	19.30	64.3

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ² Sagittarii. Right Ascension.	γ² Sagittarii. Declination South.	ο Herculis. Right Ascension.	ο Herculis. Declination North.	μ Sagittarii. Right Ascension.	μ Sagittarii. Declination South.	η Serpentis. Right Ascension.	η Serpentis. Declination South.	λ Sagittarii. Right Ascension.	λ Sagittarii. Declination South.
	h m 17 59	° ′ −30 25	h m 18 03	° ′ +28 44	h m 18 07	° ′ −21 04	h m 18 16	° ′ − 2 55	h m 18 21	° ′ −25 28
	s	″	s	″	s	″	s	″	s	″
Jan. 1.0	30.06 .21	23.6 0.4	42.19 .15	60.5 2.8	53.54 .18	57.5 0.1	13.70 .15	21.4 1.2	54.72 .17	26.7 0.2
11.0	30.27 .24	23.2 0.3	42.34 .19	57.7 2.7	53.72 .21	57.6 0.2	13.85 .18	22.6 1.2	54.89 .21	26.5 0.1
20.9	30.51 .27	22.9 0.2	42.53 .22	55.0 2.4	53.93 .25	57.8 0.2	14.03 .22	23.8 1.2	55.10 .24	26.4 0.1
30.9	30.78 .30	22.7 0.2	42.75 .25	52.6 2.1	54.18 .27	58.0 0.2	14.25 .24	25.0 1.0	55.34 .27	26.3 0.1
Feb. 9.9	31.08 .31	22.5 0.1	43.00 .28	50.5 1.8	54.45 .28	58.2 0.2	14.49 .25	26.0 0.8	55.61 .29	26.2 0.1
19.8	31.39 .33	22.4 0.1	43.28 .29	48.7 1.2	54.73 .30	58.4 0.1	14.74 .27	26.8 0.6	55.90 .30	26.1 0.1
Mar. 1.8	31.72 .33	22.3 0.0	43.57 .30	47.5 0.8	55.03 .31	58.5 0.0	15.01 .28	27.4 0.3	56.20 .31	26.0 0.1
11.8	32.05 .34	22.3 0.1	43.87 .31	46.7 0.2	55.34 .31	58.5 0.0	15.29 .28	27.7 0.0	56.51 .32	25.8 0.2
21.8	32.39 .33	22.2 0.0	44.18 .30	46.5 0.4	55.65 .31	58.4 0.1	15.57 .29	27.7 0.2	56.83 .32	25.6 0.2
31.7	32.72 .32	22.2 0.0	44.48 .30	46.9 0.9	55.96 .30	58.3 0.3	15.86 .28	27.5 0.5	57.15 .31	25.4 0.3
Apr. 10.7	33.04 .32	22.2 0.0	44.78 .28	47.8 1.3	56.26 .30	58.0 0.3	16.14 .27	27.0 0.7	57.46 .31	25.1 0.3
20.7	33.36 .30	22.2 0.0	45.06 .27	49.1 1.8	56.56 .28	57.7 0.3	16.41 .27	26.3 0.7	57.77 .31	24.8 0.3
30.7	33.66 .28	22.2 0.1	45.33 .25	50.9 2.1	56.84 .27	57.3 0.4	16.68 .25	25.3 1.0	58.07 .30	24.5 0.3
May 10.6	33.94 .26	22.3 0.1	45.58 .22	53.0 2.1	57.11 .24	57.0 0.3	16.93 .23	24.2 1.1	58.36 .29	24.2 0.3
20.6	34.20 .23	22.4 0.2	45.80 .18	55.4 2.4	57.35 .22	56.6 0.4	17.16 .20	23.0 1.2	58.62 .26	24.0 0.2
30.6	34.43 .19	22.6 0.3	45.98 .15	58.1 2.7	57.57 .19	56.2 0.3	17.36 .17	21.7 1.3	58.86 .21	23.8 0.2
June 9.5	34.62 .16	22.9 0.3	46.13 .11	60.8 2.7	57.76 .15	55.9 0.2	17.53 .14	20.4 1.3	59.07 .17	23.6 0.0
19.5	34.78 .11	23.2 0.4	46.24 .07	63.6 2.8	57.91 .11	55.7 0.2	17.67 .11	19.1 1.3	59.24 .13	23.6 0.0
29.5	34.89 .07	23.6 0.4	46.31 .02	66.3 2.7	58.02 .07	55.5 0.1	17.78 .07	17.8 1.3	59.37 .08	23.6 0.1
July 9.5	34.96 .02	24.0 0.5	46.33 .02	68.9 2.6	58.09 .03	55.4 0.1	17.85 .02	16.6 1.2	59.45 .04	23.7 0.2
19.4	34.98 .03	24.5 0.5	46.31 .06	71.3 2.4	58.12 .02	55.3 0.0	17.87 .02	15.6 1.0	59.49 .00	23.9 0.2
29.4	34.95 .08	25.0 0.4	46.25 .11	73.5 2.2	58.10 .06	55.3 0.0	17.85 .06	14.7 0.9	59.49 .06	24.1 0.3
Aug. 8.4	34.87 .12	25.4 0.4	46.14 .14	75.5 2.0	58.04 .10	55.3 0.1	17.79 .09	13.9 0.8	59.43 .09	24.4 0.3
18.4	34.75 .15	25.8 0.3	46.00 .18	77.1 1.6	57.94 .14	55.4 0.1	17.70 .13	13.3 0.6	59.34 .13	24.7 0.3
28.3	34.60 .18	26.1 0.3	45.82 .21	78.3 1.2	57.80 .17	55.5 0.0	17.57 .16	12.8 0.5	59.21 .17	25.0 0.2
Sept. 7.3	34.42 .20	26.4 0.1	45.61 .22	79.2 0.9	57.63 .18	55.5 0.0	17.41 .17	12.4 0.4	59.04 .18	25.2 0.2
17.3	34.22 .21	26.5 0.0	45.39 .22	79.8 0.6	57.45 .19	55.5 0.0	17.24 .18	12.2 0.2	58.86 .20	25.3 0.1
27.2	34.01 .20	26.5 0.2	45.17 .23	79.9 0.1	57.26 .19	55.5 0.0	17.06 .18	12.2 0.0	58.66 .20	25.4 0.1
Oct. 7.2	33.81 .19	26.3 0.3	44.94 .21	79.6 0.3	57.07 .18	55.5 0.0	16.88 .18	12.3 0.1	58.46 .19	25.4 0.0
17.2	33.62 .17	26.0 0.4	44.73 .20	78.9 0.7	56.89 .15	55.4 0.1	16.70 .15	12.5 0.2	58.27 .16	25.4 0.1
27.2	33.45 .13	25.6 0.5	44.53 .16	77.8 1.1	56.74 .13	55.3 0.1	16.55 .13	12.9 0.4	58.11 .14	25.3 0.1
Nov. 6.1	33.32 .08	25.1 0.5	44.37 .12	76.3 1.5	56.61 .08	55.2 0.1	16.42 .09	13.5 0.6	57.97 .10	25.2 0.2
16.1	33.24 .03	24.6 0.5	44.25 .08	74.4 1.9	56.53 .04	55.1 0.1	16.33 .05	13.5 0.7	57.87 .05	25.0 0.2
26.1	33.21 .02	24.0 0.6	44.17 .03	72.2 2.2	56.49 .01	55.1 0.1	16.28 .00	14.2 0.9	57.82 .00	24.7 0.3
Dec. 6.1	33.23 .07	23.4 0.6	44.14 .02	69.7 2.5	56.50 .06	55.0 0.0	16.28 .04	15.1 0.9	57.82 .05	24.4 0.1
16.0	33.30 .13	22.9 0.5	44.16 .07	67.0 2.7	56.56 .11	55.0 0.0	16.32 .08	16.1 1.0	57.87 .09	24.2 0.2
26.0	33.43 .17	22.4 0.5	44.23 .12	64.2 2.8	56.67 .15	55.0 0.1	16.40 .13	17.2 1.1	57.96 .15	23.9 0.3
36.0	33.60	22.0 0.4	44.35	61.4 2.8	56.82	55.1 0.2	16.53	18.4 1.1	58.11	23.7 0.2
						55.3		19.6 1.2		23.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	χ Draconis. Right Ascension.	χ Draconis. Declination North	τ Aquilæ. Right Ascension.	τ Aquilæ. Declination South.	ζ Pavonis. Right Ascension.	ζ Pavonis. Declination South.	α Lyræ. (Vega.) Right Ascension.	α Lyræ. (Vega.) Declination North.	β Lyræ. Right Ascension.	β Lyræ. Declination North.
	h m 18 22	+72 41	h m 18 29	− 8 18	h m 18 31	−71 30	h m 18 33	+38 41	h m 18 46	+33 14
	s	″	s	″	s	″	s	″	s	″
Jan. 1.0	44.85 .10	31.5 3.5	51.84 .15	39.2 0.9	32.27 .34	36.0 2.8	36.02 .11	38.9 3.1	26.67 .09	62.8 2.9
11.0	44.95 .25	28.0 3.4	51.99 .18	40.1 0.8	32.61 .46	33.2 2.6	36.13 .16	35.8 3.0	26.76 .15	59.9 2.8
21.0	45.20 .37	24.6 3.2	52.17 .21	40.9 0.8	33.07 .56	30.6 2.4	36.29 .20	32.8 2.8	26.91 .18	57.1 2.7
30.9	45.57 .50	21.4 2.9	52.38 .23	41.7 0.7	33.63 .65	28.2 2.1	36.49 .24	30.0 2.5	27.09 .22	54.4 2.4
Feb. 9.9	46.07 .60	18.5 2.3	52.61 .25	42.4 0.5	34.28 .73	26.1 1.8	36.73 .27	27.5 2.1	27.31 .25	52.0 2.0
19.9	46.67 .67	16.2 1.8	52.86 .27	42.9 0.4	35.01 .78	24.3 1.4	37.00 .30	25.4 1.6	27.56 .27	50.0 1.6
Mar. 1.8	47.34 .74	14.4 1.2	53.13 .28	43.3 0.2	35.79 .81	22.9 1.1	37.30 .31	23.8 1.1	27.83 .30	48.4 1.0
11.8	48.08 .76	13.2 0.6	53.41 .29	43.5 0.1	36.60 .85	21.8 0.7	37.61 .33	22.7 0.4	28.13 .30	47.4 0.5
21.8	48.84 .77	12.6 0.2	53.70 .29	43.4 0.3	37.45 .85	21.1 0.3	37.94 .33	22.3 0.1	28.43 .32	46.9 0.0
31.8	49.61 .76	12.8 0.8	53.99 .29	43.1 0.5	38.30 .84	20.8 0.0	38.27 .34	22.4 0.7	28.75 .32	46.9 0.6
Apr. 10.7	50.37 .71	13.6 1.4	54.28 .28	42.6 0.7	39.14 .82	20.8 0.5	38.61 .32	23.1 1.3	29.07 .31	47.5 1.2
20.7	51.08 .66	15.0 1.9	54.56 .27	41.9 0.8	39.96 .79	21.3 0.8	38.93 .31	24.4 1.8	29.38 .30	48.7 1.6
30.7	51.74 .57	16.9 2.5	54.83 .27	41.1 1.0	40.75 .73	22.1 1.2	39.24 .28	26.2 2.2	29.68 .28	50.3 2.1
May 10.6	52.31 .47	19.4 2.8	55.10 .24	40.1 1.0	41.48 .68	23.3 1.5	39.52 .26	28.4 2.6	29.96 .26	52.4 2.4
20.6	52.78 .37	22.2 3.1	55.34 .22	39.1 1.1	42.16 .59	24.8 1.8	39.78 .22	31.0 2.8	30.22 .23	54.8 2.7
30.6	53.15 .25	25.3 3.4	55.56 .19	38.0 1.1	42.75 .50	26.6 2.0	40.00 .18	33.8 3.0	30.45 .19	57.5 2.8
June 9.6	53.40 .13	28.7 3.4	55.75 .16	36.9 1.0	43.25 .40	28.6 2.3	40.18 .14	36.8 3.2	30.64 .15	60.3 3.0
19.5	53.53 .00	32.1 3.5	55.91 .12	35.9 1.0	43.65 .28	30.9 2.4	40.32 .09	40.0 3.1	30.79 .11	63.3 3.0
29.5	53.53 .13	35.6 3.4	56.03 .08	34.9 0.9	43.93 .16	33.3 2.5	40.41 .04	43.1 3.1	30.90 .06	66.3 2.9
July 9.5	53.40 .25	39.0 3.2	56.11 .04	34.0 0.8	44.09 .04	35.8 2.5	40.45 .01	46.2 2.8	30.96 .02	69.2 2.8
19.5	53.15 .37	42.2 2.9	56.15 .00	33.2 0.7	44.13 .09	38.3 2.4	40.44 .06	49.0 2.7	30.98 .04	72.0 2.6
29.4	52.78 .47	45.1 2.7	56.15 .04	32.5 0.6	44.04 .22	40.7 2.3	40.38 .10	51.7 2.4	30.94 .08	74.6 2.3
Aug. 8.4	52.31 .57	47.8 2.3	56.11 .09	31.9 0.4	43.82 .32	43.0 2.0	40.28 .16	54.1 2.1	30.86 .12	76.9 2.1
18.4	51.74 .65	50.1 1.9	56.02 .12	31.5 0.3	43.50 .43	45.0 1.7	40.12 .19	56.2 1.8	30.74 .16	79.0 1.7
28.4	51.09 .72	52.0 1.5	55.90 .14	31.2 0.2	43.07 .52	46.7 1.3	39.93 .22	58.0 1.3	30.58 .20	80.7 1.3
Sept. 7.3	50.37 .76	53.5 0.9	55.76 .17	31.0 0.1	42.55 .57	48.0 0.9	39.71 .25	59.3 0.9	30.38 .22	82.0 1.0
17.3	49.61 .79	54.4 0.5	55.59 .18	30.9 0.1	41.98 .61	48.9 0.4	39.46 .26	60.2 0.5	30.16 .24	83.0 0.5
27.3	48.82 .79	54.9 0.1	55.41 .19	30.8 0.1	41.37 .63	49.3 0.0	39.20 .26	60.7 0.0	29.92 .24	83.5 0.1
Oct. 7.2	48.03 .78	54.8 0.6	55.22 .17	30.9 0.2	40.74 .60	49.3 0.6	38.94 .26	60.7 0.5	29.68 .24	83.6 0.3
17.2	47.25 .75	54.2 1.2	55.05 .16	31.1 0.2	40.14 .56	48.7 1.1	38.68 .24	60.2 1.0	29.44 .22	83.3 0.8
27.2	46.50 .69	53.0 1.7	54.89 .13	31.3 0.4	39.58 .49	47.6 1.5	38.44 .21	59.2 1.4	29.22 .19	82.5 1.2
Nov. 6.2	45.81 .60	51.3 2.1	54.76 .09	31.7 0.4	39.09 .39	46.1 2.0	38.23 .18	57.8 1.8	29.03 .17	81.3 1.7
16.1	45.21 .51	49.2 2.6	54.67 .06	32.2 0.5	38.70 .27	44.1 2.3	38.05 .13	56.0 2.2	28.86 .13	79.6 2.0
26.1	44.70 .39	46.6 3.0	54.61 .01	32.7 0.5	38.43 .15	41.8 2.6	37.92 .09	53.8 2.6	28.73 .08	77.6 2.3
Dec. 6.1	44.31 .26	43.6 3.3	54.60 .03	33.4 0.7	38.28 .01	39.2 2.7	37.83 .03	51.2 2.8	28.65 .03	75.3 2.7
16.0	44.05 .13	40.3 3.5	54.63 .08	34.2 0.8	38.27 .13	36.5 2.8	37.80 .02	48.4 3.1	28.62 .02	72.6 2.8
26.0	43.92 .02	36.8 3.6	54.71 .12	35.0 0.8	38.40 .26	33.7 2.7	37.82 .08	45.3 3.1	28.64 .06	69.8 2.9
36.0	43.94	33.2	54.83	35.9 0.9	38.66	31.0 2.7	37.90	42.2 3.1	28.70	66.9

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	σ Sagittarii R.A. (h m 18 49)	σ Sagittarii Decl. South (° ' −26 24)	50 Draconis R.A. (h m 18 49)	50 Draconis Decl. North (° ' +75 18)	γ Lyræ R.A. (h m 18 55)	γ Lyræ Decl. North (° ' +32 33)	ζ Aquilæ R.A. (h m 19 00)	ζ Aquilæ Decl. North (° ' +13 42)	σ Octantis R.A. (h 19)	σ Octantis Decl. South (° ' −89 14)
Jan. 1.0	10.62 .15	60.5 0.3	26.94 .00	75.2 3.5	15.65 .09	25.7 2.9	53.64 .10	70.8 2.0	1 37.5 03.9	59.5 3.5
11.0	10.77 .18	60.2 0.3	26.94 .17	71.7 3.5	15.74 .13	22.8 2.8	53.74 .13	68.8 2.0	1 41.4 06.9	56.0 3.3
21.0	10.95 .21	59.9 0.3	27.11 .33	68.2 3.3	15.87 .17	20.0 2.6	53.87 .17	66.8 2.0	1 48.3 09.7	52.7 3.2
30.9	11.16 .25	59.6 0.3	27.44 .48	64.9 3.0	16.04 .21	17.4 2.4	54.04 .20	64.9 1.9	1 58.0 12.3	49.5 2.9
Feb. 9.9	11.41 .27	59.3 0.4	27.92 .61	61.9 2.6	16.25 .24	15.0 2.1	54.24 .22	63.2 1.7	2 10.3 14.4	46.6 2.5
19.9	11.68 .29	58.9 0.4	28.53 .73	59.3 2.0	16.49 .27	12.9 1.6	54.46 .25	61.8 1.4	2 24.7 16.1	44.1 2.2
Mar. 1.9	11.97 .30	58.5 0.4	29.26 .80	57.3 1.5	16.76 .29	11.3 1.1	54.71 .26	60.8 1.0	2 40.8 17.5	41.9 1.7
11.8	12.27 .31	58.1 0.4	30.06 .87	55.8 0.9	17.05 .30	10.2 0.5	54.97 .27	60.1 0.7	2 58.3 18.5	40.2 1.3
21.8	12.58 .32	57.7 0.5	30.93 .89	54.9 0.2	17.35 .31	9.7 0.0	55.24 .28	59.9 0.2	3 16.8 18.9	38.9 0.8
31.8	12.90 .32	57.2 0.4	31.82 .89	54.7 0.4	17.66 .32	9.7 0.5	55.52 .29	60.0 0.1	3 35.7 19.1	38.1 0.4
Apr. 10.7	13.22 .32	56.8 0.6	32.71 .85	55.1 1.1	17.98 .31	10.2 1.1	55.81 .29	60.6 0.6	3 54.8 18.8	37.7 0.2
20.7	13.54 .32	56.2 0.5	33.56 .80	56.2 1.6	18.29 .30	11.3 1.6	56.10 .28	61.6 1.0	4 13.6 18.1	37.9 0.6
30.7	13.86 .30	55.7 0.4	34.36 .72	57.8 2.2	18.59 .29	12.9 2.0	56.38 .27	62.9 1.3	4 31.7 17.1	38.5 1.1
May 10.7	14.16 .28	55.3 0.4	35.08 .62	60.0 2.6	18.88 .26	14.9 2.4	56.65 .25	64.6 1.7	4 48.8 15.7	39.6 1.5
20.6	14.44 .26	54.9 0.3	35.70 .50	62.6 3.0	19.14 .24	17.3 2.6	56.90 .23	66.5 1.9	5 04.5 13.9	41.1 1.9
30.6	14.70 .24	54.6 0.2	36.20 .36	65.6 3.2	19.38 .20	19.9 2.9	57.13 .21	68.6 2.1	5 18.4 11.8	43.0 2.3
June 9.6	14.94 .19	54.4 0.2	36.56 .22	68.8 3.4	19.58 .16	22.8 2.9	57.34 .17	70.7 2.3	5 30.2 09.5	45.3 2.6
19.6	15.13 .16	54.2 0.0	36.78 .07	72.2 3.5	19.74 .12	25.7 3.0	57.51 .13	73.0 2.2	5 39.7 07.0	47.9 2.8
29.5	15.29 .11	54.2 0.1	36.85 .07	75.7 3.5	19.86 .07	28.7 2.9	57.64 .10	75.2 2.2	5 46.7 04.1	50.7 2.9
July 9.5	15.40 .07	54.3 0.2	36.78 .22	79.2 3.4	19.93 .03	31.6 2.8	57.74 .05	77.4 2.0	5 50.8 01.2	53.6 3.0
19.5	15.47 .02	54.5 0.3	36.56 .37	82.6 3.2	19.96 .03	34.4 2.6	57.79 .00	79.4 1.9	5 52.0 01.8	56.6 3.0
29.4	15.49 .03	54.8 0.4	36.19 .49	85.8 2.9	19.93 .07	37.0 2.4	57.79 .03	81.3 1.7	5 50.2 04.7	59.6 2.9
Aug. 8.4	15.46 .07	55.2 0.4	35.70 .62	88.7 2.6	19.86 .11	39.4 2.1	57.76 .08	83.0 1.4	5 45.5 07.5	62.5 2.6
18.4	15.39 .12	55.6 0.4	35.08 .72	91.3 2.3	19.75 .16	41.5 1.7	57.68 .11	84.4 1.2	5 38.0 10.1	65.1 2.4
28.4	15.27 .15	56.0 0.3	34.36 .80	93.6 1.8	19.59 .18	43.2 1.4	57.57 .15	85.6 1.0	5 27.9 12.3	67.5 1.9
Sept. 7.3	15.12 .18	56.3 0.3	33.56 .87	95.4 1.4	19.41 .22	44.6 1.1	57.42 .17	86.6 0.6	5 15.6 14.2	69.4 1.5
17.3	14.94 .19	56.6 0.2	32.69 .92	96.8 0.9	19.19 .23	45.7 0.6	57.25 .18	87.2 0.4	5 01.4 15.5	70.9 0.9
27.3	14.75 .20	56.8 0.2	31.77 .95	97.7 0.4	18.96 .23	46.3 0.2	57.07 .20	87.6 0.3	4 45.9 16.2	71.8 0.3
Oct. 7.3	14.55 .20	57.0 0.0	30.82 .95	98.1 0.2	18.73 .24	46.5 0.2	56.87 .20	87.7 0.3	4 29.7 16.3	72.1 0.3
17.2	14.35 .17	57.0 0.0	29.88 .94	97.9 0.7	18.49 .22	46.2 0.3	56.68 .19	87.4 0.5	4 13.4 15.7	71.8 1.0
27.2	14.18 .15	57.0 0.2	28.97 .91	97.2 1.3	18.27 .20	45.5 1.1	56.50 .18	86.9 0.8	3 57.7 14.6	70.8 1.3
Nov. 6.2	14.03 .12	56.8 0.2	28.11 .86	95.9 1.8	18.07 .17	44.4 1.6	56.35 .15	86.1 1.1	3 43.1 12.8	69.3 2.1
16.1	13.91 .08	56.6 0.3	27.32 .79	94.1 2.2	17.90 .13	42.8 1.9	56.22 .13	85.0 1.4	3 30.3 10.5	67.2 2.5
26.1	13.83 .03	56.3 0.3	26.64 .68	91.9 2.7	17.77 .09	40.9 2.3	56.13 .09	83.6 1.6	3 19.8 07.7	64.7 2.9
Dec. 6.1	13.80 .02	56.0 0.3	26.08 .56	89.2 3.0	17.68 .04	38.6 2.5	56.07 .06	82.0 1.8	3 12.1 04.8	61.8 3.2
16.1	13.82 .07	55.7 0.3	25.66 .42	86.2 3.4	17.64 .01	36.1 2.7	56.06 .01	80.2 2.0	3 07.3 01.5	58.6 3.4
26.0	13.89 .12	55.4 0.3	25.39 .27	82.8 3.4	17.65 .06	33.4 2.9	56.09 .03	78.2 2.0	3 05.8 01.7	55.2 3.4
36.0	14.01	55.1 0.3	25.29 .10	79.4 3.4	17.71	30.5 2.9	56.16 .07	76.2 2.0	3 07.5	51.8 3.4

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	ι Lyræ. Right Ascension.	ι Lyræ. Declination North.	d Sagittarii. Right Ascension.	d Sagittarii. Declination South.	δ Draconis. Right Ascension.	δ Draconis. Declination North.	θ Lyræ. Right Ascension.	θ Lyræ. Declination North.	τ Draconis. Right Ascension.	τ Draconis. Declination North.
	h m 19 03	° ' +35 56	h m 19 11	° ' −19 07	h m 19 12	° ' +67 29	h m 19 12	° ' +37 57	h m 19 17	° ' +73 10
	s	"	s	"	s	"	s	"	s	"
Jan. 1.0	47.24 (.08)	55.0 (2.9)	53.45 (.11)	32.7 (0.1)	28.93 (.01)	31.8 (3.4)	56.89 (.06)	42.0 (3.0)	22.19 (.08)	36.8 (3.4)
11.0	47.32 (.12)	52.1 (2.9)	53.56 (.15)	32.8 (0.0)	28.92 (.01)	28.4 (3.5)	56.95 (.11)	39.0 (2.9)	22.11 (.07)	33.4 (3.5)
21.0	47.44 (.16)	49.2 (2.8)	53.71 (.18)	32.8 (0.0)	29.01 (.09)	24.9 (3.4)	57.06 (.15)	36.1 (2.9)	22.18 (.22)	29.9 (3.4)
30.9	47.60 (.21)	46.4 (2.5)	53.89 (.21)	32.8 (0.1)	29.21 (.20)	21.5 (3.1)	57.21 (.20)	33.2 (2.6)	22.40 (.35)	26.5 (3.1)
Feb. 9.9	47.81 (.24)	43.9 (2.2)	54.10 (.24)	32.7 (0.1)	29.51 (.30)	18.4 (2.8)	57.41 (.23)	30.6 (2.3)	22.75 (.47)	23.4 (2.8)
19.9	48.05 (.26)	41.7 (1.7)	54.34 (.26)	32.6 (0.2)	29.89 (.47)	15.6 (2.2)	57.64 (.27)	28.3 (1.8)	23.22 (.58)	20.6 (2.4)
Mar. 1.9	48.31 (.30)	40.0 (1.2)	54.60 (.26)	32.4 (0.4)	30.36 (.52)	13.4 (1.8)	57.91 (.29)	26.5 (1.3)	23.80 (.66)	18.2 (1.8)
11.8	48.61 (.30)	38.8 (0.7)	54.86 (.30)	32.0 (0.4)	30.88 (.58)	11.6 (1.1)	58.20 (.31)	25.2 (0.8)	24.46 (.73)	16.4 (1.2)
21.8	48.91 (.32)	38.1 (0.1)	55.16 (.30)	31.6 (0.6)	31.46 (.60)	10.5 (0.5)	58.51 (.33)	24.4 (0.1)	25.19 (.78)	15.2 (0.6)
31.8	49.23 (.33)	38.0 (0.5)	55.46 (.30)	31.0 (0.7)	32.06 (.61)	10.0 (0.2)	58.84 (.33)	24.3 (0.4)	25.97 (.79)	14.6 (0.1)
Apr. 10.8	49.56 (.32)	38.5 (1.0)	55.76 (.31)	30.3 (0.7)	32.67 (.60)	10.2 (0.8)	59.17 (.33)	24.7 (0.9)	26.76 (.78)	14.7 (0.7)
20.7	49.88 (.32)	39.5 (1.6)	56.07 (.30)	29.6 (0.8)	33.27 (.58)	11.0 (1.5)	59.50 (.32)	25.6 (1.5)	27.54 (.74)	15.4 (1.4)
30.7	50.20 (.30)	41.1 (2.0)	56.37 (.30)	28.8 (0.9)	33.85 (.54)	12.5 (2.0)	59.82 (.31)	27.1 (2.0)	28.28 (.69)	16.8 (1.9)
May 10.7	50.50 (.27)	43.1 (2.4)	56.67 (.28)	27.9 (0.8)	34.39 (.48)	14.5 (2.5)	60.13 (.29)	29.1 (2.4)	28.97 (.61)	18.7 (2.4)
20.6	50.77 (.25)	45.5 (2.7)	56.95 (.26)	27.1 (0.8)	34.87 (.41)	17.0 (2.9)	60.42 (.26)	31.5 (2.7)	29.58 (.52)	21.1 (2.8)
30.6	51.02 (.21)	48.2 (2.9)	57.21 (.24)	26.3 (0.7)	35.28 (.32)	19.9 (3.2)	60.68 (.22)	34.2 (2.9)	30.10 (.41)	23.9 (3.1)
June 9.6	51.23 (.17)	51.1 (3.0)	57.45 (.21)	25.6 (0.7)	35.60 (.24)	23.1 (3.4)	60.90 (.18)	37.1 (3.1)	30.51 (.30)	27.0 (3.3)
19.6	51.40 (.13)	54.1 (3.1)	57.66 (.17)	24.9 (0.5)	35.84 (.15)	26.5 (3.5)	61.08 (.14)	40.2 (3.1)	30.81 (.17)	30.3 (3.5)
29.5	51.53 (.08)	57.2 (3.1)	57.83 (.13)	24.4 (0.4)	35.99 (.04)	30.0 (3.5)	61.22 (.09)	43.3 (3.1)	30.98 (.03)	33.8 (3.6)
July 9.5	51.61 (.03)	60.3 (2.9)	57.96 (.08)	24.0 (0.2)	36.03 (.05)	33.5 (3.5)	61.31 (.04)	46.4 (3.1)	31.01 (.09)	37.4 (3.5)
19.5	51.64 (.02)	63.2 (2.8)	58.04 (.04)	23.8 (0.2)	35.98 (.16)	37.0 (3.4)	61.35 (.02)	49.5 (2.9)	30.92 (.22)	40.9 (3.3)
29.5	51.62 (.07)	66.0 (2.5)	58.08 (.01)	23.6 (0.0)	35.82 (.24)	40.4 (3.1)	61.33 (.07)	52.4 (2.6)	30.70 (.34)	44.2 (3.2)
Aug. 8.4	51.55 (.12)	68.5 (2.3)	58.07 (.05)	23.6 (0.1)	35.58 (.34)	43.5 (2.9)	61.26 (.11)	55.0 (2.4)	30.36 (.45)	47.4 (3.0)
18.4	51.43 (.16)	70.7 (2.0)	58.02 (.09)	23.7 (0.1)	35.24 (.41)	46.4 (2.5)	61.15 (.16)	57.4 (2.0)	29.91 (.56)	50.4 (2.6)
28.4	51.27 (.19)	72.7 (1.5)	57.93 (.13)	23.8 (0.2)	34.83 (.48)	48.9 (2.1)	60.99 (.19)	59.4 (1.7)	29.35 (.65)	53.0 (2.2)
Sept. 7.3	51.08 (.22)	74.2 (1.2)	57.80 (.16)	24.0 (0.2)	34.35 (.53)	51.0 (1.7)	60.80 (.23)	61.1 (1.3)	28.70 (.71)	55.2 (1.7)
17.3	50.86 (.24)	75.4 (0.7)	57.64 (.18)	24.2 (0.2)	33.82 (.57)	52.7 (1.2)	60.57 (.24)	62.4 (0.8)	27.99 (.77)	56.9 (1.3)
27.3	50.62 (.25)	76.1 (0.3)	57.46 (.19)	24.4 (0.2)	33.25 (.59)	53.9 (0.7)	60.33 (.26)	63.2 (0.4)	27.22 (.80)	58.2 (0.8)
Oct. 7.3	50.37 (.25)	76.4 (0.2)	57.27 (.18)	24.6 (0.2)	32.66 (.59)	54.6 (0.1)	60.07 (.26)	63.6 (0.0)	26.42 (.81)	59.0 (0.3)
17.2	50.12 (.24)	76.2 (0.6)	57.09 (.17)	24.8 (0.2)	32.06 (.60)	54.7 (0.4)	59.81 (.24)	63.6 (0.6)	25.61 (.81)	59.3 (0.3)
27.2	49.88 (.21)	75.6 (1.1)	56.92 (.16)	25.0 (0.1)	31.47 (.56)	54.3 (1.0)	59.57 (.23)	63.0 (1.0)	24.80 (.76)	59.0 (0.8)
Nov. 6.2	49.67 (.19)	74.5 (1.5)	56.76 (.12)	25.1 (0.1)	30.91 (.51)	53.3 (1.5)	59.34 (.20)	62.0 (1.4)	24.04 (.72)	58.2 (1.4)
16.2	49.48 (.14)	73.0 (1.9)	56.64 (.09)	25.2 (0.1)	30.40 (.45)	51.8 (2.0)	59.14 (.16)	60.6 (1.9)	23.32 (.64)	56.8 (2.0)
26.1	49.34 (.11)	71.1 (2.3)	56.55 (.05)	25.3 (0.1)	29.95 (.38)	49.8 (2.5)	58.98 (.11)	58.7 (2.2)	22.68 (.54)	54.8 (2.4)
Dec. 6.1	49.23 (.06)	68.8 (2.6)	56.50 (.00)	25.4 (0.1)	29.57 (.28)	47.3 (2.9)	58.87 (.08)	56.5 (2.6)	22.14 (.43)	52.4 (2.8)
16.1	49.17 (.00)	66.2 (2.8)	56.50 (.04)	25.5 (0.0)	29.29 (.19)	44.4 (3.2)	58.79 (.02)	53.9 (2.8)	21.71 (.30)	49.6 (3.1)
26.0	49.17 (.04)	63.4 (2.9)	56.54 (.09)	25.5 (0.1)	29.10 (.08)	41.2 (3.4)	58.77 (.03)	51.1 (3.0)	21.41 (.17)	46.5 (3.4)
36.0	49.21	60.5	56.63	25.6	29.02	37.8	58.80	48.1	21.24	43.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Aquilæ. Right Ascension.	δ Aquilæ. Declination North.	β Cygni. Right Ascension.	β Cygni. Declination North.	κ Aquilæ. Right Ascension.	κ Aquilæ. Declination South.	β Sagittæ. Right Ascension.	β Sagittæ. Declination North.	; Aquilæ. Right Ascension.	; Aquilæ. Declination North.
	h m 19 20	° ′ + 2 55	h m 19 26	° ′ +27 45	h m 19 31	° ′ − 7 14	h m 19 36	° ′ +17 14	h m 19 41	° ′ +10 22
	s	″	s	″	s	″	s	″	s	″
Jan. 1.0	32.83 .08	16.4 1.4	45.31 .06	22.5 2.6	36.61 .08	36.9 0.8	38.16 .06	64.6 2.1	35.42 .06	35.5 1.7
11.0	32.91 .13	15.0 1.3	45.37 .10	19.9 2.6	36.69 .12	37.7 0.7	38.22 .10	62.5 2.1	35.48 .10	33.8 1.7
21.0	33.04 .15	13.7 1.2	45.47 .14	17.3 2.5	36.81 .15	38.4 0.6	38.32 .13	60.4 2.1	35.58 .13	32.1 1.6
31.0	33.19 .19	12.5 1.1	45.61 .17	14.8 2.2	36.96 .18	39.0 0.6	38.45 .16	58.4 2.0	35.71 .16	30.5 1.5
Feb. 9.9	33.38 .21	11.4 0.9	45.78 .21	12.6 2.0	37.14 .21	39.6 0.3	38.61 .20	56.6 1.5	35.87 .19	29.0 1.2
19.9	33.59 .23	10.5 0.7	45.99 .24	10.6 1.6	37.35 .23	39.9 0.2	38.81 .22	55.1 1.3	36.06 .22	27.8 1.0
Mar. 1.9	33.82 .25	9.8 0.4	46.23 .26	9.0 1.1	37.58 .25	40.1 0.0	39.03 .24	53.8 0.8	36.28 .24	26.8 0.6
11.9	34.07 .27	9.4 0.0	46.49 .28	7.9 0.7	37.83 .26	40.1 0.0	39.27 .27	53.0 0.4	36.52 .25	26.2 0.2
21.8	34.34 .27	9.4 0.3	46.77 .30	7.2 0.1	38.09 .28	39.9 0.5	39.54 .27	52.6 0.0	36.77 .27	26.0 0.1
31.8	34.61 .28	9.7 0.7	47.07 .30	7.1 0.4	38.37 .29	39.4 0.7	39.81 .29	52.6 0.5	37.04 .28	26.1 0.5
Apr. 10.8	34.89 .29	10.4 0.9	47.37 .31	7.5 0.9	38.66 .29	38.7 0.9	40.10 .29	53.1 0.9	37.32 .29	26.6 0.9
20.7	35.18 .28	11.3 1.2	47.68 .30	8.4 1.4	38.95 .29	37.8 1.1	40.39 .29	54.0 1.2	37.61 .29	27.5 1.3
30.7	35.46 .28	12.5 1.4	47.98 .29	9.8 1.8	39.24 .29	36.7 1.3	40.68 .29	55.2 1.7	37.90 .29	28.8 1.5
May 10.7	35.74 .27	13.9 1.6	48.27 .28	11.6 2.1	39.53 .27	35.4 1.3	40.97 .27	56.9 1.9	38.19 .27	30.3 1.8
20.7	36.01 .25	15.5 1.7	48.55 .26	13.7 2.5	39.80 .26	34.1 1.3	41.24 .26	58.8 2.2	38.46 .26	32.1 2.0
30.6	36.26 .22	17.2 1.8	48.81 .23	16.2 2.6	40.06 .24	32.8 1.4	41.50 .23	61.0 2.3	38.72 .23	34.1 2.1
June 9.6	36.48 .19	19.0 1.8	49.04 .19	18.8 2.8	40.30 .21	31.4 1.3	41.73 .20	63.3 2.4	38.95 .21	36.2 2.1
19.6	36.67 .16	20.8 1.7	49.23 .15	21.6 2.8	40.51 .18	30.1 1.3	41.93 .17	65.7 2.5	39.16 .17	38.3 2.2
29.6	36.83 .12	22.5 1.7	49.38 .11	24.4 2.8	40.69 .13	28.8 1.1	42.10 .13	68.2 2.4	39.33 .14	40.5 2.1
July 9.5	36.95 .08	24.2 1.5	49.49 .07	27.2 2.8	40.82 .10	27.7 1.0	42.23 .08	70.6 2.3	39.47 .09	42.6 2.0
19.5	37.03 .03	25.7 1.4	49.56 .02	30.0 2.6	40.92 .05	26.7 0.9	42.31 .04	72.9 2.1	39.56 .05	44.6 1.8
29.5	37.06 .01	27.1 1.3	49.58 .03	32.6 2.3	40.97 .01	25.8 0.7	42.35 .01	75.0 2.0	39.61 .00	46.4 1.7
Aug. 8.4	37.05 .05	28.4 1.3	49.55 .08	34.9 2.2	40.98 .04	25.1 0.6	42.34 .05	77.0 1.8	39.61 .04	48.1 1.4
18.4	37.00 .05	29.4 1.0	49.47 .12	37.1 1.8	40.94 .08	24.5 0.4	42.29 .09	78.8 1.5	39.57 .08	49.5 1.2
28.4	36.91 .09	30.2 0.8	49.35 .15	38.9 1.5	40.86 .11	24.1 0.2	42.20 .13	80.3 1.2	39.49 .11	50.7 1.0
	.12	0.7								
Sept. 7.4	36.79 .15	30.9 0.4	49.20 .18	40.4 1.2	40.75 .14	23.9 0.1	42.07 .16	81.5 0.9	39.38 .15	51.7 0.8
17.3	36.64 .16	31.3 0.2	49.02 .21	41.6 0.8	40.61 .17	23.8 0.0	41.91 .18	82.4 0.6	39.23 .17	52.5 0.4
27.3	36.48 .18	31.5 0.1	48.81 .21	42.4 0.4	40.44 .17	23.8 0.0	41.73 .18	83.0 0.3	39.06 .18	52.9 0.2
Oct. 7.3	36.30 .18	31.6 0.2	48.60 .22	42.8 0.0	40.27 .18	23.9 0.2	41.55 .20	83.3 0.0	38.88 .18	53.1 0.0
17.3	36.12 .17	31.4 0.4	48.38 .21	42.8 0.4	40.09 .17	24.1 0.3	41.35 .18	83.3 0.3	38.70 .18	53.1 0.4
27.2	35.95 .15	31.0 0.6	48.17 .19	42.4 0.9	39.92 .14	24.4 0.4	41.17 .18	83.0 0.7	38.52 .16	52.7 0.6
Nov. 6.2	35.80 .13	30.4 0.7	47.98 .17	41.5 1.2	39.78 .14	24.8 0.5	40.99 .15	82.3 1.0	38.36 .14	52.1 0.8
16.2	35.67 .10	29.7 0.9	47.81 .14	40.3 1.5	39.64 .10	25.3 0.5	40.84 .12	81.3 1.3	38.22 .11	51.3 1.1
26.1	35.57 .06	28.8 1.1	47.67 .10	38.8 1.9	39.54 .06	25.8 0.7	40.72 .08	80.0 1.5	38.11 .08	50.2 1.3
Dec. 6.1	35.51 .01	27.7 1.2	47.57 .06	36.9 2.2	39.48 .02	26.5 0.7	40.64 .05	78.5 1.8	38.03 .05	48.9 1.5
16.1	35.50 .02	26.5 1.4	47.51 .01	34.7 2.4	39.46 .02	27.2 0.7	40.59 .01	76.7 2.0	37.98 .00	47.4 1.6
26.1	35.52 .06	25.1 1.4	47.50 .03	32.3 2.6	39.48 .05	27.9 0.8	40.58 .03	74.7 2.1	37.98 .03	45.8 1.7
36.0	35.58	23.7	47.53	29.7	39.53	28.7	40.61	72.6	38.01	44.1

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	δ Cygni Right Ascension	δ Cygni Declination North	α Aquilæ (Altair) Right Ascension	α Aquilæ (Altair) Declination North	ε Draconis Right Ascension	ε Draconis Declination North	ε Pavonis Right Ascension	ε Pavonis Declination South	β Aquilæ Right Ascension	β Aquilæ Declination North
	h m 19 41	° ′ +44 53	h m 19 45	° ′ + 8 36	h m 19 48	° ′ +70 00	h m 19 49	° ′ −73 09	h m 19 50	° ′ + 6 09
	s	″	s	″	s	″	s	″	s	″
Jan. 1.1	53.57 .01	40.7 3.1	59.52 .06	41.6 1.6	27.32 .12	80.1 3.3	12.18 .10	66.4 3.0	29.39 .06	50.5 1.5
11.0	53.58 .07	37.6 3.1	59.58 .09	40.0 1.6	27.20 .01	76.8 3.5	12.28 .23	63.4 3.0	29.45 .09	49.0 1.4
21.0	53.65 .12	34.5 3.1	59.67 .13	38.4 1.6	27.19 .11	73.3 3.4	12.51 .36	60.3 3.1	29.54 .12	47.6 1.4
31.0	53.77 .17	31.4 2.8	59.80 .16	36.9 1.5	27.30 .23	69.9 3.2	12.87 .48	57.3 3.0	29.66 .16	46.2 1.4
Feb. 9.9	53.94 .22	28.6 2.6	59.96 .19	35.5 1.4	27.53 .34	66.7 3.1	13.35 .58	54.4 2.9	29.82 .19	44.9 1.3
19.9	54.16 .26	26.0 2.2	60.15 .21	34.4 0.9	27.87 .43	63.6 2.6	13.93 .67	51.6 2.5	30.01 .21	43.9 1.0
Mar. 1.9	54.42 .29	23.8 1.6	60.36 .24	33.5 0.5	28.30 .53	61.0 2.1	14.60 .75	49.1 2.2	30.22 .23	43.1 0.8
11.9	54.71 .32	22.2 1.2	60.60 .25	33.0 0.2	28.83 .59	58.9 1.6	15.35 .81	46.9 1.9	30.45 .25	42.7 0.4
21.8	55.03 .34	21.0 0.5	60.85 .27	32.8 0.2	29.42 .64	57.3 0.9	16.16 .85	45.0 1.5	30.70 .26	42.5 0.2
31.8	55.37 .36	20.5 0.1	61.12 .28	33.0 0.6	30.06 .67	56.4 0.3	17.01 .89	43.5 1.1	30.96 .28	42.7 0.2
Apr. 10.8	55.73 .37	20.6 0.7	61.40 .29	33.6 0.9	30.73 .68	56.1 0.4	17.90 .90	42.4 0.7	31.24 .29	43.3 0.6
20.8	56.10 .36	21.3 1.2	61.69 .29	34.5 1.2	31.41 .67	56.5 1.0	18.80 .90	41.7 0.3	31.53 .29	44.2 0.9
30.7	56.46 .34	22.5 1.8	61.98 .29	35.7 1.5	32.08 .63	57.5 1.5	19.70 .88	41.4 0.1	31.82 .28	45.4 1.2
May 10.7	56.80 .33	24.3 2.3	62.27 .27	37.2 1.8	32.71 .59	59.0 2.1	20.58 .84	41.5 0.5	32.10 .28	46.9 1.5
20.7	57.13 .30	26.6 2.6	62.54 .26	39.0 1.9	33.30 .52	61.1 2.6	21.42 .79	42.0 1.0	32.38 .26	48.6 1.7
30.6	57.43 .27	29.2 3.0	62.80 .24	40.9 2.1	33.82 .44	63.7 3.0	22.21 .72	43.0 1.3	32.64 .24	50.4 1.8
June 9.6	57.70 .22	32.2 3.1	63.04 .22	43.0 2.1	34.26 .34	66.7 3.2	22.93 .62	44.3 1.7	32.88 .22	52.4 2.0
19.6	57.92 .18	35.3 3.3	63.26 .18	45.1 2.1	34.60 .25	69.9 3.5	23.55 .52	46.0 2.0	33.10 .18	54.3 1.9
29.6	58.10 .12	38.6 3.4	63.44 .14	47.2 2.0	34.85 .14	73.4 3.5	24.07 .40	48.0 2.3	33.28 .15	56.3 2.0
July 9.5	58.22 .06	42.0 3.3	63.58 .09	49.2 1.9	34.99 .02	76.9 3.6	24.47 .27	50.3 2.4	33.43 .10	58.2 1.9
19.5	58.28 .01	45.3 3.2	63.67 .05	51.1 1.8	35.01 .08	80.5 3.6	24.74 .13	52.7 2.6	33.53 .06	60.0 1.8
29.5	58.29 .05	48.5 3.0	63.73 .01	52.9 1.6	34.93 .20	84.1 3.4	24.87 .02	55.3 2.6	33.59 .02	61.6 1.6
Aug. 8.5	58.24 .11	51.5 2.7	63.74 .03	54.5 1.4	34.73 .29	87.5 3.2	24.85 .15	57.9 2.5	33.61 .03	63.0 1.4
18.4	58.13 .15	54.2 2.5	63.71 .08	55.9 1.2	34.44 .39	90.7 2.9	24.70 .29	60.4 2.4	33.58 .07	64.3 1.3
28.4	57.98 .20	56.7 2.1	63.63 .11	57.1 0.9	34.05 .47	93.6 2.5	24.41 .41	62.8 2.1	33.51 .11	65.4 1.1
Sept. 7.4	57.78 .24	58.8 1.7	63.52 .14	58.0 0.7	33.58 .55	96.1 2.2	24.00 .52	64.9 1.8	33.40 .13	66.2 0.8
17.3	57.54 .26	60.5 1.3	63.38 .16	58.7 0.4	33.03 .60	98.3 1.7	23.48 .60	66.7 1.4	33.27 .16	66.8 0.6
27.3	57.28 .28	61.8 0.8	63.22 .17	59.1 0.2	32.43 .64	100.0 1.2	22.88 .66	68.1 0.9	33.11 .17	67.1 0.3
Oct. 7.3	57.00 .29	62.6 0.3	63.05 .18	59.3 0.0	31.79 .66	101.2 0.7	22.22 .68	69.0 0.4	32.94 .18	67.3 0.1
17.3	56.71 .28	62.9 0.2	62.87 .18	59.3 0.3	31.13 .66	101.9 0.2	21.54 .68	69.4 0.1	32.76 .18	67.2 0.3
27.2	56.43 .27	62.7 0.7	62.69 .16	59.0 0.6	30.47 .65	102.1 0.4	20.86 .65	69.3 0.6	32.58 .16	66.9 0.6
Nov. 6.2	56.16 .25	62.0 1.1	62.53 .14	58.4 0.8	29.82 .62	101.7 1.0	20.21 .58	68.7 1.2	32.42 .14	66.3 0.7
16.2	55.91 .21	60.9 1.7	62.39 .11	57.6 1.0	29.20 .56	100.7 1.5	19.63 .50	67.5 1.7	32.28 .11	65.6 1.0
26.2	55.70 .17	59.2 2.1	62.28 .08	56.6 1.2	28.64 .50	99.2 2.1	19.13 .39	65.8 2.1	32.17 .08	64.6 1.1
Dec. 6.1	55.53 .13	57.1 2.5	62.20 .05	55.4 1.4	28.14 .40	97.1 2.5	18.74 .27	63.7 2.4	32.09 .04	63.5 1.3
16.1	55.40 .07	54.6 2.8	62.15 .00	54.0 1.5	27.74 .31	94.6 2.9	18.47 .13	61.3 2.7	32.05 .01	62.2 1.4
26.1	55.33 .02	51.8 3.0	62.15 .03	52.5 1.6	27.43 .20	91.7 3.2	18.34 .01	58.6 2.9	32.04 .03	60.8 1.5
36.0	55.31	48.8	62.18	50.9	27.23	88.5	18.35	55.7	32.07	59.3

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	γ Sagittæ. Right Ascension	γ Sagittæ. Declination North	⟨ Sagittarii. Right Ascension	⟨ Sagittarii. Declination South	τ Aquilæ. Right Ascension	τ Aquilæ. Declination North	θ Aquilæ. Right Ascension	θ Aquilæ. Declination South	31 Cygni. Right Ascension	31 Cygni. Declination North
	h m 19 54	° ' +19 13	h m 19 56	° ' −27 58	h m 19 59	° ' + 7 00	h m 20 06	° ' − 1 06	h m 20 10	° ' +46 26
	s	"	s	"	s	"	s	"	s	"
Jan. 1.1	23.28 (.04)	42.4 (2.1)	37.29 (.07)	52.5 (0.6)	20.61 (.05)	13.2 (1.5)	14.40 (.04)	37.1 (1.0)	31.70 (.03)	51.9 (3.0)
11.0	23.32 (.07)	40.3 (2.1)	37.36 (.11)	51.9 (0.7)	20.66 (.08)	11.7 (1.5)	14.44 (.08)	38.1 (1.0)	31.67 (.03)	48.9 (3.1)
21.0	23.39 (.12)	38.2 (2.0)	37.47 (.15)	51.2 (0.7)	20.74 (.12)	10.2 (1.4)	14.52 (.12)	39.1 (0.9)	31.70 (.08)	45.8 (3.1)
31.0	23.51 (.15)	36.2 (1.9)	37.62 (.18)	50.5 (0.8)	20.86 (.14)	8.8 (1.2)	14.64 (.14)	40.0 (0.8)	31.78 (.13)	42.7 (2.9)
Feb. 10.0	23.66 (.18)	34.3 (1.7)	37.80 (.21)	49.7 (0.8)	21.00 (.18)	7.6 (1.1)	14.78 (.17)	40.8 (0.6)	31.91 (.18)	39.8 (2.7)
19.9	23.84 (.20)	32.6 (1.3)	38.01 (.24)	48.9 (0.9)	21.18 (.20)	6.5 (0.8)	14.95 (.20)	41.4 (0.4)	32.09 (.23)	37.1 (2.4)
Mar. 1.9	24.04 (.24)	31.3 (1.0)	38.25 (.26)	48.0 (0.9)	21.38 (.23)	5.7 (0.5)	15.15 (.22)	41.8 (0.2)	32.32 (.27)	34.7 (1.9)
11.9	24.28 (.25)	30.3 (0.5)	38.51 (.29)	47.1 (1.0)	21.61 (.24)	5.2 (0.1)	15.37 (.25)	42.0 (0.2)	32.59 (.31)	32.8 (1.4)
21.8	24.53 (.27)	29.8 (0.1)	38.80 (.30)	46.1 (1.0)	21.85 (.26)	5.1 (0.2)	15.62 (.26)	41.8 (0.4)	32.90 (.34)	31.4 (0.8)
31.8	24.80 (.29)	29.7 (0.4)	39.10 (.32)	45.1 (1.1)	22.11 (.28)	5.3 (0.5)	15.88 (.27)	41.4 (0.7)	33.24 (.36)	30.6 (0.2)
Apr. 10.8	25.09 (.29)	30.1 (0.8)	39.42 (.32)	44.0 (1.0)	22.39 (.29)	5.8 (0.9)	16.15 (.29)	40.7 (1.0)	33.60 (.37)	30.4 (0.4)
20.8	25.38 (.30)	30.9 (1.2)	39.74 (.33)	43.0 (1.0)	22.68 (.29)	6.7 (1.3)	16.44 (.29)	39.7 (1.2)	33.97 (.37)	30.8 (1.0)
30.7	25.68 (.29)	32.1 (1.6)	40.07 (.33)	42.0 (1.0)	22.97 (.29)	8.0 (1.5)	16.73 (.29)	38.5 (1.4)	34.34 (.37)	31.8 (1.5)
May 10.7	25.97 (.29)	33.7 (2.0)	40.40 (.32)	41.0 (0.8)	23.26 (.28)	9.5 (1.7)	17.02 (.29)	37.1 (1.6)	34.71 (.36)	33.3 (2.1)
20.7	26.26 (.27)	35.7 (2.2)	40.72 (.31)	40.2 (0.7)	23.54 (.26)	11.2 (1.9)	17.31 (.27)	35.5 (1.6)	35.07 (.33)	35.4 (2.4)
30.7	26.53 (.24)	37.9 (2.3)	41.03 (.28)	39.5 (0.6)	23.80 (.25)	13.1 (1.9)	17.58 (.25)	33.9 (1.7)	35.40 (.30)	37.8 (2.8)
June 9.6	26.77 (.22)	40.2 (2.5)	41.31 (.26)	38.9 (0.4)	24.05 (.22)	15.0 (2.1)	17.83 (.23)	32.2 (1.7)	35.70 (.25)	40.6 (3.1)
19.6	26.99 (.18)	42.7 (2.5)	41.57 (.22)	38.5 (0.2)	24.27 (.19)	17.1 (2.0)	18.06 (.20)	30.5 (1.7)	35.95 (.21)	43.7 (3.3)
29.6	27.17 (.14)	45.2 (2.6)	41.79 (.18)	38.3 (0.1)	24.46 (.15)	19.1 (2.0)	18.26 (.17)	28.8 (1.6)	36.16 (.16)	47.0 (3.3)
July 9.5	27.31 (.10)	47.8 (2.4)	41.97 (.14)	38.2 (0.2)	24.61 (.11)	21.1 (1.8)	18.43 (.12)	27.2 (1.4)	36.32 (.10)	50.3 (3.4)
19.5	27.41 (.05)	50.2 (2.3)	42.11 (.08)	38.4 (0.3)	24.72 (.07)	22.9 (1.7)	18.55 (.08)	25.8 (1.3)	36.42 (.05)	53.7 (3.3)
29.5	27.46 (.01)	52.5 (2.1)	42.19 (.04)	38.7 (0.4)	24.79 (.03)	24.6 (1.6)	18.63 (.03)	24.5 (1.1)	36.47 (.02)	57.0 (3.2)
Aug. 8.5	27.47 (.04)	54.6 (1.9)	42.23 (.01)	39.1 (0.6)	24.82 (.02)	26.2 (1.3)	18.66 (.01)	23.4 (0.9)	36.45 (.07)	60.2 (3.0)
18.4	27.43 (.08)	56.5 (1.7)	42.22 (.06)	39.7 (0.6)	24.80 (.07)	27.5 (1.1)	18.65 (.05)	22.5 (0.8)	36.38 (.13)	63.2 (2.7)
28.4	27.35 (.11)	58.2 (1.4)	42.16 (.11)	40.3 (0.7)	24.73 (.10)	28.6 (0.9)	18.60 (.09)	21.7 (0.5)	36.25 (.17)	65.9 (2.4)
Sept. 7.4	27.24 (.15)	59.6 (1.1)	42.05 (.14)	41.0 (0.6)	24.63 (.13)	29.5 (0.7)	18.51 (.12)	21.2 (0.4)	36.08 (.22)	68.3 (2.0)
17.4	27.09 (.17)	60.7 (0.7)	41.91 (.17)	41.6 (0.6)	24.50 (.15)	30.2 (0.4)	18.39 (.15)	20.8 (0.2)	35.86 (.25)	70.3 (1.6)
27.3	26.92 (.19)	61.4 (0.5)	41.74 (.19)	42.2 (0.6)	24.35 (.17)	30.6 (0.2)	18.24 (.16)	20.6 (0.0)	35.61 (.27)	71.9 (1.2)
Oct. 7.3	26.73 (.19)	61.9 (0.1)	41.55 (.20)	42.8 (0.4)	24.18 (.18)	30.8 (0.0)	18.08 (.17)	20.6 (0.2)	35.34 (.29)	73.1 (0.7)
17.3	26.54 (.19)	62.0 (0.2)	41.35 (.19)	43.2 (0.3)	24.00 (.17)	30.8 (0.3)	17.91 (.17)	20.8 (0.3)	35.05 (.29)	73.8 (0.2)
27.2	26.35 (.18)	61.8 (0.6)	41.16 (.17)	43.5 (0.2)	23.83 (.16)	30.5 (0.5)	17.74 (.16)	21.1 (0.4)	34.76 (.28)	74.0 (0.4)
Nov. 6.2	26.17 (.16)	61.2 (0.9)	40.99 (.16)	43.7 (0.0)	23.67 (.15)	30.0 (0.7)	17.58 (.14)	21.5 (0.6)	34.48 (.26)	73.6 (0.8)
16.2	26.01 (.13)	60.3 (1.2)	40.83 (.13)	43.7 (0.1)	23.52 (.11)	29.3 (1.0)	17.44 (.12)	22.1 (0.7)	34.22 (.24)	72.8 (1.4)
26.2	25.88 (.10)	59.1 (1.5)	40.70 (.08)	43.6 (0.3)	23.41 (.09)	28.3 (1.1)	17.32 (.09)	22.8 (0.8)	33.98 (.20)	71.4 (1.8)
Dec. 6.1	25.78 (.07)	57.6 (1.8)	40.62 (.05)	43.3 (0.3)	23.32 (.05)	27.2 (1.3)	17.23 (.05)	23.6 (1.0)	33.78 (.16)	69.6 (2.2)
16.1	25.71 (.02)	55.8 (2.0)	40.57 (.00)	43.0 (0.4)	23.27 (.02)	25.9 (1.4)	17.18 (.01)	24.6 (1.0)	33.62 (.12)	67.4 (2.6)
26.1	25.69 (.01)	53.8 (2.1)	40.57 (.04)	42.6 (0.6)	23.25 (.02)	24.5 (1.5)	17.17 (.02)	25.6 (1.0)	33.50 (.06)	64.8 (2.9)
36.1	25.70	51.7	40.61	42.0	23.27	23.0	17.19	26.6	33.44	61.9

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	κ Cephei (pr.) Right Ascension.	κ Cephei (pr.) Declination North.	a² Capricorni. Right Ascension.	a² Capricorni. Declination South.	a Pavonis. Right Ascension.	a Pavonis. Declination South.	γ Cygni. Right Ascension.	γ Cygni. Declination North.	π Capricorni. Right Ascension.	π Capricorni. Declination South.
	h m 20 12	° ′ +77 24	h m 20 12	° ′ −12 50	h m 20 17	° ′ −57 02	h m 20 18	° ′ +39 56	h m 20 21	° ′ −18 31
	s	″	s	″	s	″	s	″	s	″
Jan. 1.1	$6.92_{0.36}$	$75.6_{3.1}$	$36.53_{.05}$	$49.9_{0.3}$	$52.25_{.04}$	$56.4_{2.2}$	$41.81_{.02}$	$47.4_{2.8}$	$42.19_{.04}$	$54.3_{0.0}$
11.0	$6.56_{0.17}$	$72.5_{3.3}$	$36.58_{.08}$	$50.2_{0.3}$	$52.29_{.10}$	$54.2_{2.4}$	$41.79_{.02}$	$44.6_{2.8}$	$42.23_{.07}$	$54.3_{0.1}$
21.0	$6.39_{0.02}$	$69.2_{3.4}$	$36.66_{.11}$	$50.5_{0.1}$	$52.39_{.17}$	$51.8_{2.4}$	$41.81_{.08}$	$41.8_{2.9}$	$42.30_{.11}$	$54.2_{0.2}$
31.0	$6.41_{0.21}$	$65.8_{3.4}$	$36.77_{.15}$	$50.6_{0.1}$	$52.56_{.23}$	$49.4_{2.5}$	$41.89_{.12}$	$38.9_{2.8}$	$42.41_{.15}$	$54.0_{0.3}$
Feb. 10.0	$6.62_{0.39}$	$62.4_{3.1}$	$36.92_{.18}$	$50.7_{0.0}$	$52.79_{.28}$	$46.9_{2.4}$	$42.01_{.16}$	$36.1_{2.5}$	$42.56_{.17}$	$53.7_{0.4}$
19.9	$7.01_{0.56}$	$59.3_{2.8}$	$37.10_{.20}$	$50.7_{0.2}$	$53.07_{.34}$	$44.5_{2.3}$	$42.17_{.21}$	$33.6_{2.2}$	$42.73_{.20}$	$53.3_{0.6}$
Mar. 1.9	$7.57_{0.72}$	$56.5_{2.4}$	$37.30_{.22}$	$50.5_{0.4}$	$53.41_{.38}$	$42.2_{2.1}$	$42.38_{.24}$	$31.4_{1.8}$	$42.93_{.22}$	$52.7_{0.7}$
11.9	$8.29_{0.84}$	$54.1_{1.9}$	$37.52_{.25}$	$50.1_{0.6}$	$53.79_{.41}$	$40.1_{2.0}$	$42.62_{.28}$	$29.6_{1.3}$	$43.15_{.25}$	$52.0_{0.8}$
21.9	$9.13_{0.93}$	$52.2_{1.3}$	$37.77_{.27}$	$49.5_{0.8}$	$54.20_{.45}$	$38.1_{1.8}$	$42.90_{.31}$	$28.3_{0.7}$	$43.40_{.27}$	$51.2_{1.0}$
31.8	$10.06_{1.00}$	$50.9_{0.7}$	$38.04_{.28}$	$48.7_{0.9}$	$54.65_{.48}$	$36.3_{1.5}$	$43.21_{.32}$	$27.6_{0.1}$	$43.67_{.28}$	$50.2_{1.0}$
Apr. 10.8	$11.06_{1.03}$	$50.2_{0.0}$	$38.32_{.29}$	$47.8_{1.1}$	$55.13_{.49}$	$34.8_{1.3}$	$43.53_{.34}$	$27.5_{0.4}$	$43.95_{.30}$	$49.2_{1.2}$
20.8	$12.09_{1.02}$	$50.2_{0.6}$	$38.61_{.30}$	$46.7_{1.2}$	$55.62_{.50}$	$33.5_{0.9}$	$43.87_{.35}$	$27.9_{0.9}$	$44.25_{.31}$	$48.0_{1.2}$
30.7	$13.11_{0.99}$	$50.8_{1.2}$	$38.91_{.30}$	$45.5_{1.3}$	$56.12_{.50}$	$32.6_{0.6}$	$44.22_{.34}$	$28.8_{1.5}$	$44.56_{.31}$	$46.8_{1.3}$
May 10.7	$14.10_{0.92}$	$52.0_{1.8}$	$39.21_{.30}$	$44.2_{1.3}$	$56.62_{.50}$	$32.0_{0.2}$	$44.56_{.33}$	$30.3_{2.0}$	$44.87_{.31}$	$45.5_{1.2}$
20.7	$15.02_{0.83}$	$53.8_{2.2}$	$39.51_{.29}$	$42.9_{1.3}$	$57.12_{.47}$	$31.8_{0.0}$	$44.89_{.32}$	$32.3_{2.4}$	$45.18_{.30}$	$44.3_{1.2}$
30.7	$15.85_{0.70}$	$56.0_{2.7}$	$39.80_{.27}$	$41.6_{1.3}$	$57.59_{.45}$	$31.8_{0.5}$	$45.21_{.29}$	$34.7_{2.7}$	$45.48_{.28}$	$43.1_{1.1}$
June 9.6	$16.55_{0.57}$	$58.7_{3.0}$	$40.07_{.24}$	$40.3_{1.2}$	$58.04_{.40}$	$32.3_{0.8}$	$45.50_{.25}$	$37.4_{3.0}$	$45.76_{.26}$	$42.0_{1.0}$
19.6	$17.12_{0.42}$	$61.7_{3.3}$	$40.31_{.22}$	$39.1_{1.1}$	$58.44_{.35}$	$33.1_{1.1}$	$45.75_{.21}$	$40.4_{3.1}$	$46.02_{.23}$	$41.0_{0.9}$
29.6	$17.54_{0.26}$	$65.0_{3.5}$	$40.53_{.17}$	$38.0_{1.0}$	$58.79_{.29}$	$34.2_{1.4}$	$45.96_{.17}$	$43.5_{3.2}$	$46.25_{.19}$	$40.1_{0.6}$
July 9.6	$17.80_{0.08}$	$68.5_{3.6}$	$40.70_{.14}$	$37.0_{0.8}$	$59.08_{.22}$	$35.6_{1.6}$	$46.13_{.11}$	$46.7_{3.2}$	$46.44_{.15}$	$39.5_{0.5}$
19.5	$17.88_{0.08}$	$72.1_{3.6}$	$40.84_{.09}$	$36.2_{0.6}$	$59.30_{.15}$	$37.2_{1.9}$	$46.24_{.07}$	$49.9_{3.2}$	$46.59_{.11}$	$39.0_{0.4}$
29.5	$17.80_{0.25}$	$75.7_{3.5}$	$40.93_{.05}$	$35.6_{0.5}$	$59.45_{.07}$	$39.1_{1.9}$	$46.31_{.00}$	$53.1_{3.0}$	$46.70_{.05}$	$38.6_{0.1}$
Aug. 8.5	$17.55_{0.40}$	$79.2_{3.4}$	$40.98_{.00}$	$35.1_{0.3}$	$59.52_{.01}$	$41.0_{2.0}$	$46.31_{.04}$	$56.1_{2.8}$	$46.75_{.01}$	$38.5_{0.0}$
18.4	$17.15_{0.56}$	$82.6_{3.1}$	$40.98_{.04}$	$34.8_{0.1}$	$59.51_{.09}$	$43.0_{2.0}$	$46.27_{.10}$	$58.9_{2.6}$	$46.76_{.03}$	$38.5_{0.2}$
28.4	$16.59_{0.69}$	$85.7_{2.8}$	$40.94_{.09}$	$34.7_{0.0}$	$59.42_{.16}$	$45.0_{1.9}$	$46.17_{.14}$	$61.5_{2.3}$	$46.73_{.08}$	$38.7_{0.3}$
Sept. 7.4	$15.90_{0.82}$	$88.5_{2.6}$	$40.85_{.12}$	$34.7_{0.1}$	$59.26_{.23}$	$46.9_{1.8}$	$46.03_{.18}$	$63.8_{1.9}$	$46.65_{.12}$	$39.0_{0.4}$
17.4	$15.08_{0.90}$	$91.1_{2.1}$	$40.73_{.14}$	$34.8_{0.2}$	$59.03_{.27}$	$48.7_{1.4}$	$45.85_{.21}$	$65.7_{1.5}$	$46.53_{.14}$	$39.4_{0.4}$
27.3	$14.18_{0.99}$	$93.2_{1.6}$	$40.59_{.16}$	$35.0_{0.3}$	$58.76_{.31}$	$50.1_{1.4}$	$45.64_{.23}$	$67.2_{1.5}$	$46.39_{.16}$	$39.8_{0.4}$
Oct. 7.3	$13.19_{1.04}$	$94.8_{1.2}$	$40.43_{.18}$	$35.3_{0.3}$	$58.45_{.31}$	$51.3_{1.2}$	$45.41_{.25}$	$68.3_{1.1}$	$46.23_{.18}$	$40.2_{0.4}$
17.3	$12.15_{1.06}$	$96.0_{0.6}$	$40.25_{.17}$	$35.6_{0.3}$	$58.11_{.34}$	$52.1_{0.8}$	$45.16_{.25}$	$69.0_{0.7}$	$46.05_{.17}$	$40.7_{0.5}$
27.3	$11.09_{1.06}$	$96.6_{0.0}$	$40.08_{.16}$	$36.0_{0.4}$	$57.77_{.32}$	$52.5_{0.1}$	$44.91_{.24}$	$69.2_{0.3}$	$45.88_{.17}$	$41.1_{0.4}$
Nov. 6.2	$10.03_{1.03}$	$96.6_{0.5}$	$39.92_{.14}$	$36.4_{0.4}$	$57.45_{.30}$	$52.4_{0.1}$	$44.67_{.24}$	$68.9_{0.3}$	$45.71_{.15}$	$41.5_{0.4}$
16.2	$9.00_{0.97}$	$96.1_{1.1}$	$39.78_{.14}$	$36.8_{0.4}$	$57.15_{.30}$	$52.0_{0.4}$	$44.44_{.23}$	$68.1_{0.8}$	$45.56_{.15}$	$41.8_{0.3}$
26.2	$8.03_{0.89}$	$95.0_{1.6}$	$39.66_{.12}$	$37.2_{0.4}$	$56.89_{.26}$	$51.1_{0.9}$	$44.23_{.21}$	$66.9_{1.2}$	$45.43_{.13}$	$42.1_{0.3}$
Dec. 6.1	$7.14_{0.77}$	$93.4_{2.2}$	$39.57_{.09}$	$37.6_{0.4}$	$56.68_{.21}$	$49.8_{1.3}$	$44.06_{.17}$	$65.2_{1.7}$	$45.34_{.09}$	$42.3_{0.2}$
16.1	$6.37_{0.63}$	$91.2_{2.6}$	$39.52_{.05}$	$38.0_{0.4}$	$56.54_{.14}$	$48.2_{1.6}$	$43.92_{.14}$	$63.1_{2.1}$	$45.28_{.06}$	$42.5_{0.2}$
26.1	$5.74_{0.47}$	$88.6_{2.6}$	$39.50_{.02}$	$38.4_{0.4}$	$56.46_{.08}$	$46.3_{1.9}$	$43.83_{.09}$	$60.7_{2.4}$	$45.26_{.02}$	$42.5_{0.0}$
36.1	$5.27_{0.47}$	$85.7_{2.9}$	$39.52_{.02}$	$38.8_{0.4}$	$56.45_{.01}$	$44.2_{2.1}$	$43.78_{.05}$	$58.0_{2.7}$	$45.27_{.01}$	$42.6_{0.1}$

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Delphini. Right Ascension.	ε Delphini. Declination. North.	Groombridge 3241. Right Ascension.	Groombridge 3241. Declination. North.	a Delphini. Right Ascension.	a Delphini. Declination. North.	β Pavonis. Right Ascension.	β Pavonis. Declination. South.	a Cygni. Right Ascension.	a Cygni. Declination. North.
	h m 20 28	° ′ +10 58	h m 20 30	° ′ +72 11	h m 20 35	° ′ +15 33	h m 20 36	° ′ -66 32	h m 20 38	° ′ +44 55
	s	″	s	″	s	″	s	″	s	″
Jan. 1.1	31.39 .02	21.1 1.6	23.02 .26	76.3 3.0	4.70 .01	68.8 1.8	5.52 .02	80.9 2.7	4.59 .05	62.8 2.8
11.1	31.41 .05	19.5 1.6	22.76 .15	73.3 3.3	4.71 .04	67.0 1.8	5.50 .06	78.2 2.9	4.54 .01	60.0 2.9
21.0	31.46 .08	17.9 1.6	22.61 .02	70.0 3.3	4.75 .07	65.2 1.8	5.56 .16	75.3 2.9	4.53 .04	57.1 3.0
31.0	31.54 .12	16.3 1.4	22.59 .12	66.7 3.4	4.82 .11	63.4 1.7	5.72 .25	72.4 2.9	4.57 .10	54.1 2.9
Feb. 10.0	31.66 .15	14.9 1.2	22.71 .25	63.3 3.2	4.93 .14	61.7 1.5	5.97 .32	69.5 2.9	4.67 .14	51.2 2.7
19.9	31.81 .17	13.7 1.0	22.96 .37	60.1 2.9	5.07 .17	60.2 1.2	6.29 .40	66.6 2.8	4.81 .20	48.5 2.5
Mar. 1.9	31.98 .21	12.7 0.7	23.33 .49	57.2 2.5	5.24 .20	59.0 0.9	6.69 .46	63.8 2.6	5.01 .23	46.0 2.0
11.9	32.19 .22	12.0 0.3	23.82 .58	54.7 2.1	5.44 .23	58.1 0.5	7.15 .53	61.2 2.4	5.24 .28	44.0 1.5
21.9	32.41 .25	11.7 0.0	24.40 .65	52.6 1.4	5.67 .25	57.6 0.1	7.68 .57	58.8 2.1	5.52 .31	42.5 1.0
31.8	32.66 .27	11.7 0.5	25.05 .71	51.2 0.9	5.92 .27	57.5 0.3	8.25 .61	56.7 1.8	5.83 .34	41.5 0.5
Apr. 10.8	32.93 .28	12.2 0.8	25.76 .75	50.3 0.2	6.19 .28	57.8 0.8	8.86 .64	54.9 1.5	6.17 .36	41.0 0.2
20.8	33.21 .30	13.0 1.2	26.51 .75	50.1 0.4	6.47 .29	58.6 1.1	9.50 .65	53.4 1.1	6.53 .37	41.2 0.7
30.8	33.51 .29	14.2 1.5	27.26 .74	50.5 1.1	6.76 .30	59.7 1.5	10.15 .66	52.3 0.7	6.90 .37	41.9 1.3
May 10.7	33.80 .29	15.7 1.7	28.00 .71	51.6 1.6	7.06 .30	61.2 1.8	10.81 .66	51.6 0.3	7.27 .37	43.2 1.8
20.7	34.09 .29	17.4 2.0	28.71 .65	53.2 2.1	7.36 .30	63.0 2.0	11.47 .63	51.3 0.2	7.63 .36	45.0 2.3
30.7	34.38 .26	19.4 2.1	29.36 .57	55.3 2.6	7.65 .27	65.0 2.2	12.10 .60	51.5 0.6	7.97 .32	47.3 2.6
June 9.6	34.64 .24	21.5 2.2	29.93 .49	57.9 3.0	7.92 .24	67.2 2.3	12.70 .55	52.1 0.9	8.29 .29	49.9 2.9
19.6	34.88 .21	23.7 2.2	30.42 .38	60.9 3.3	8.16 .22	69.5 2.4	13.25 .47	53.0 1.4	8.58 .24	52.8 3.2
29.6	35.09 .18	25.9 2.2	30.80 .27	64.2 3.5	8.38 .18	71.9 2.4	13.72 .41	54.4 1.7	8.82 .19	56.0 3.3
July 9.6	35.27 .13	28.1 2.1	31.07 .15	67.7 3.6	8.56 .14	74.3 2.4	14.13 .31	56.1 1.9	9.01 .14	59.3 3.3
19.5	35.40 .10	30.2 2.0	31.22 .02	71.3 3.6	8.70 .09	76.7 2.2	14.44 .22	58.0 2.2	9.15 .09	62.6 3.4
29.5	35.50 .05	32.2 1.9	31.24 .09	74.9 3.6	8.79 .05	78.9 2.1	14.66 .11	60.2 2.2	9.24 .02	66.0 3.2
Aug. 8.5	35.55 .00	34.1 1.6	31.15 .21	78.5 3.5	8.84 .01	81.0 1.9	14.77 .00	62.6 2.4	9.26 .03	69.2 3.1
18.5	35.55 .04	35.7 1.4	30.94 .32	82.0 3.3	8.85 .04	82.9 1.6	14.77 .10	65.0 2.4	9.23 .09	72.3 2.8
28.4	35.51 .08	37.1 1.1	30.62 .43	85.3 2.9	8.81 .08	84.5 1.4	14.67 .20	67.4 2.3	9.14 .13	75.1 2.6
Sept. 7.4	35.43 .12	38.2 0.9	30.19 .52	88.2 2.7	8.73 .11	85.9 1.1	14.47 .29	69.7 2.1	9.01 .18	77.7 2.2
17.4	35.31 .14	39.1 0.7	29.67 .59	90.9 2.3	8.62 .14	87.0 0.9	14.18 .37	71.8 1.8	8.83 .22	79.9 1.8
27.3	35.17 .16	39.8 0.4	29.08 .66	93.2 1.9	8.48 .16	87.9 0.5	13.81 .42	73.6 1.5	8.61 .24	81.7 1.4
Oct. 7.3	35.01 .17	40.2 0.1	28.42 .70	95.1 1.3	8.32 .17	88.4 0.3	13.39 .46	75.1 1.0	8.37 .26	83.1 1.0
17.3	34.84 .17	40.3 0.2	27.72 72	96.4 0.9	8.15 .18	88.7 0.1	12.93 .48	76.1 0.5	8.11 .27	84.1 0.5
27.3	34.67 .17	40.1 0.4	27.00 .73	97.3 0.2	7.97 .17	88.6 0.3	12.45 .47	76.6 0.1	7.84 .27	84.6 0.0
Nov. 6.2	34.50 .15	39.7 0.6	26.27 .71	97.5 0.3	7.80 .16	88.3 0.7	11.98 .45	76.7 0.5	7.57 .26	84.6 0.6
16.2	34.35 .13	39.1 0.9	25.56 .68	97.2 0.9	7.64 .14	87.6 0.9	11.53 .41	76.2 0.9	7.31 .24	84.0 1.0
26.2	34.22 .11	38.2 1.1	24.88 .62	96.3 1.5	7.50 .12	86.7 1.2	11.12 .34	75.3 1.5	7.07 .21	83.0 1.5
Dec. 6.2	34.11 .08	37.1 1.4	24.26 .55	94.8 2.0	7.38 .08	85.5 1.4	10.78 .26	73.8 1.8	6.86 .17	81.5 2.0
16.1	34.03 .04	35.7 1.4	23.71 .45	92.8 2.4	7.30 .06	84.1 1.6	10.52 .18	72.0 2.2	6.69 .13	79.5 2.3
26.1	33.99 .01	34.3 1.6	23.26 35	90.4 2.9	7.24 .02	82.5 1.5	10.34 .08	69.8 2.5	6.56 .09	77.2 2.7
36.1	33.98	32.7 1.6	22.91	87.5	7.22	80.7	10.26	67.3 2.5	6.47	74.5 2.7

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	ψ Capricorni. Right Ascension.	ψ Capricorni. Declination South.	ε Cygni. Right Ascension.	ε Cygni. Declination North.	μ Aquarii. Right Ascension.	μ Aquarii. Declination South.	12 Year Cat. 1879. Right Ascension.	12 Year Cat. 1879. Declination North.	ν Cygni. Right Ascension.	ν Cygni. Declination North.
	h m 20 40	° ' −25 37	h m 20 42	° ' +33 36	h m 20 47	° ' − 9 20	h m 20 51	° ' +80 10	h m 20 53	° ' +40 47
	s	"	s	"	s	"	s	"	s	"
Jan. 1.1	17.08 (.02)	20.0 (0.5)	14.15 (.03)	24.2 (2.5)	21.68 (.01)	59.0 (0.5)	57.60 (0.68)	85.5 (2.8)	30.50 (.06)	37.7 (2.6)
11.1	17.10 (.06)	19.5 (0.6)	14.12 (.01)	21.7 (2.6)	21.69 (.05)	59.5 (0.4)	56.92 (0.45)	82.7 (3.1)	30.44 (.02)	35.1 (2.8)
21.1	17.16 (.09)	18.9 (0.7)	14.13 (.05)	19.1 (2.6)	21.74 (.08)	59.9 (0.3)	56.47 (0.22)	79.6 (3.2)	30.42 (.03)	32.3 (2.8)
31.0	17.25 (.13)	18.2 (0.8)	14.18 (.10)	16.5 (2.5)	21.82 (.10)	60.2 (0.2)	56.25 (0.03)	76.4 (3.4)	30.45 (.08)	29.5 (2.8)
Feb. 10.0	17.38 (.16)	17.4 (0.9)	14.28 (.13)	14.0 (2.3)	21.92 (.14)	60.4 (0.1)	56.28 (0.27)	73.0 (3.2)	30.53 (.12)	26.7 (2.6)
20.0	17.54 (.19)	16.5 (1.0)	14.41 (.18)	11.7 (2.0)	22.06 (.17)	60.5 (0.2)	56.55 (0.51)	69.8 (3.1)	30.65 (.17)	24.1 (2.3)
Mar. 1.9	17.73 (.22)	15.5 (1.1)	14.59 (.21)	9.7 (1.6)	22.23 (.19)	60.3 (0.3)	57.06 (0.73)	66.7 (2.7)	30.82 (.21)	21.8 (2.0)
11.9	17.95 (.25)	14.4 (1.2)	14.80 (.24)	8.1 (1.2)	22.42 (.22)	60.0 (0.6)	57.79 (0.91)	64.0 (2.3)	31.03 (.25)	19.8 (1.5)
21.9	18.20 (.27)	13.2 (1.2)	15.04 (.27)	6.9 (0.7)	22.64 (.25)	59.4 (0.7)	58.70 (1.07)	61.7 (1.8)	31.28 (.28)	18.3 (1.0)
31.9	18.47 (.29)	12.0 (1.3)	15.31 (.30)	6.2 (0.2)	22.89 (.26)	58.7 (1.0)	59.77 (1.19)	59.9 (1.2)	31.56 (.31)	17.3 (0.5)
Apr. 10.8	18.76 (.31)	10.7 (1.4)	15.61 (.31)	6.0 (0.3)	23.15 (.28)	57.7 (1.2)	60.96 (1.26)	58.7 (0.6)	31.87 (.34)	16.8 (0.1)
20.8	19.07 (.32)	9.3 (1.3)	15.92 (.33)	6.3 (0.9)	23.43 (.29)	56.5 (1.3)	62.22 (1.30)	58.1 (0.0)	32.21 (.35)	16.9 (0.7)
30.8	19.39 (.32)	8.0 (1.3)	16.25 (.33)	7.2 (1.4)	23.72 (.30)	55.2 (1.4)	63.52 (1.29)	58.1 (0.6)	32.56 (.35)	17.6 (1.2)
May 10.7	19.71 (.33)	6.7 (1.3)	16.58 (.32)	8.6 (1.8)	24.02 (.30)	53.8 (1.5)	64.81 (1.24)	58.7 (1.2)	32.91 (.35)	18.8 (1.7)
20.7	20.04 (.32)	5.4 (1.1)	16.90 (.32)	10.4 (2.2)	24.32 (.30)	52.3 (1.6)	66.05 (1.15)	59.9 (1.8)	33.26 (.34)	20.5 (2.2)
30.7	20.36 (.30)	4.3 (0.9)	17.22 (.29)	12.6 (2.5)	24.62 (.28)	50.7 (1.6)	67.20 (1.03)	61.7 (2.3)	33.60 (.32)	22.7 (2.5)
June 9.7	20.66 (.28)	3.4 (0.8)	17.51 (.27)	15.1 (2.8)	24.90 (.27)	49.1 (1.5)	68.23 (0.88)	64.0 (2.7)	33.92 (.29)	25.2 (2.8)
19.6	20.94 (.26)	2.6 (0.6)	17.78 (.23)	17.9 (2.9)	25.17 (.23)	47.6 (1.3)	69.11 (0.70)	66.7 (3.0)	34.21 (.25)	28.0 (3.0)
29.6	21.20 (.21)	2.0 (0.3)	18.01 (.19)	20.8 (3.1)	25.40 (.21)	46.3 (1.3)	69.81 (0.51)	69.7 (3.3)	34.46 (.20)	31.0 (3.2)
July 9.6	21.41 (.18)	1.7 (0.2)	18.20 (.14)	23.9 (3.0)	25.61 (.16)	45.0 (1.1)	70.32 (0.31)	73.0 (3.5)	34.66 (.16)	34.2 (3.2)
19.6	21.59 (.13)	1.5 (0.1)	18.34 (.10)	26.9 (3.0)	25.77 (.12)	43.9 (0.9)	70.63 (0.11)	76.5 (3.6)	34.82 (.11)	37.4 (3.3)
29.5	21.72 (.08)	1.6 (0.2)	18.44 (.04)	29.9 (2.9)	25.89 (.08)	43.0 (0.7)	70.74 (0.11)	80.1 (3.6)	34.93 (.05)	40.7 (3.1)
Aug. 8.5	21.80 (.02)	1.8 (0.5)	18.48 (.00)	32.8 (2.7)	25.97 (.03)	42.3 (0.5)	70.63 (0.32)	83.7 (3.6)	34.98 (.00)	43.8 (3.0)
18.5	21.82 (.02)	2.3 (0.5)	18.48 (.06)	35.5 (2.5)	26.00 (.01)	41.8 (0.4)	70.31 (0.51)	87.3 (3.4)	34.98 (.06)	46.8 (2.8)
28.5	21.80 (.06)	2.8 (0.7)	18.42 (.10)	38.0 (2.2)	25.99 (.06)	41.4 (0.2)	69.80 (0.70)	90.7 (3.3)	34.92 (.10)	49.6 (2.5)
Sept. 7.4	21.74 (.11)	3.5 (0.7)	18.32 (.13)	40.2 (1.9)	25.93 (.09)	41.2 (0.0)	69.10 (0.86)	94.0 (2.9)	34.82 (.15)	52.1 (2.2)
17.4	21.63 (.14)	4.2 (0.8)	18.19 (.17)	42.1 (1.5)	25.84 (.12)	41.2 (0.2)	68.24 (1.02)	96.9 (2.6)	34.67 (.18)	54.3 (1.9)
27.4	21.49 (.16)	5.0 (0.7)	18.02 (.20)	43.6 (1.2)	25.72 (.14)	41.4 (0.2)	67.22 (1.14)	99.5 (2.2)	34.49 (.21)	56.2 (1.4)
Oct. 7.3	21.33 (.18)	5.7 (0.6)	17.82 (.20)	44.8 (0.7)	25.58 (.16)	41.6 (0.3)	66.08 (1.23)	101.7 (1.8)	34.28 (.23)	57.6 (1.0)
17.3	21.15 (.18)	6.3 (0.6)	17.62 (.22)	45.5 (0.3)	25.42 (.17)	41.9 (0.4)	64.85 (1.31)	103.5 (1.3)	34.05 (.24)	58.6 (0.6)
27.3	20.97 (.18)	6.9 (0.4)	17.40 (.22)	45.8 (0.1)	25.25 (.16)	42.3 (0.5)	63.54 (1.34)	104.8 (0.7)	33.81 (.25)	59.2 (0.1)
Nov. 6.3	20.79 (.16)	7.3 (0.3)	17.18 (.20)	45.7 (0.5)	25.09 (.15)	42.8 (0.5)	62.20 (1.34)	105.5 (0.2)	33.56 (.23)	59.3 (0.4)
16.2	20.63 (.15)	7.6 (0.2)	16.98 (.18)	45.2 (1.0)	24.94 (.12)	43.3 (0.5)	60.86 (1.30)	105.7 (0.5)	33.33 (.22)	58.9 (0.9)
26.2	20.48 (.11)	7.8 (0.0)	16.80 (.16)	44.2 (1.4)	24.82 (.11)	43.8 (0.6)	59.56 (1.23)	105.2 (1.0)	33.11 (.19)	58.0 (1.3)
Dec. 6.2	20.37 (.08)	7.8 (0.1)	16.64 (.13)	42.8 (1.8)	24.71 (.07)	44.4 (0.5)	58.33 (1.13)	104.2 (1.6)	32.92 (.16)	56.7 (1.8)
16.1	20.29 (.04)	7.7 (0.2)	16.51 (.09)	41.0 (2.1)	24.64 (.05)	44.9 (0.6)	57.20 (0.98)	102.6 (2.1)	32.76 (.13)	54.9 (2.1)
26.1	20.25 (.01)	7.5 (0.4)	16.42 (.06)	38.9 (2.4)	24.59 (.01)	45.5 (0.5)	56.22 (0.81)	100.5 (2.6)	32.63 (.09)	52.8 (2.5)
36.1	20.24	7.1	16.36	36.5	24.58	46.0	55.41	97.9	32.54	50.3

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	61¹ Cygni.		ζ Cygni.		τ Cygni.		a Cephei.		ι Pegasi.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 21 02	° ' +38 15	h m 21 08	° ' +29 49	h m 21 10	° ' +37 37	h m 21 16	° ' +62 10	h m 21 17	° ' +19 23
	s	"	s	"	s	"	s	"	s	"
Jan. 1.1	29.63 .05	77.1 2.4	45.47 .04	42.6 2.2	52.23 .06	52.0 2.4	13.30 .21	32.2 2.7	32.94 .04	17.6 1.8
11.1	29.58 .01	74.7 2.5	45.43 .01	40.4 2.3	52.17 .03	49.6 2.6	13.09 .14	29.5 3.0	32.90 .00	15.8 1.8
21.1	29.57 .03	72.2 2.6	45.42 .02	38.1 2.4	52.14 .01	47.0 2.6	12.95 .06	26.5 3.2	32.90 .03	14.0 1.9
31.0	29.60 .08	69.6 2.6	45.44 .07	35.7 2.3	52.15 .06	44.4 2.6	12.89 .01	23.3 3.2	32.93 .06	12.1 1.8
Feb. 10.0	29.68 .12	67.0 2.4	45.51 .10	33.4 2.2	52.21 .10	41.8 2.5	12.90 .10	20.1 3.2	32.99 .10	10.3 1.6
20.0	29.80 .16	64.6 2.2	45.61 .15	31.2 1.9	52.31 .15	39.3 2.3	13.00 .18	16.9 3.0	33.09 .13	8.7 1.4
Mar. 2.0	29.96 .21	62.4 1.8	45.76 .17	29.3 1.6	52.46 .18	37.0 1.9	13.18 .26	13.9 2.7	33.22 .16	7.3 1.2
11.9	30.17 .24	60.6 1.4	45.93 .22	27.7 1.2	52.64 .23	35.1 1.5	13.44 .33	11.2 2.2	33.38 .20	6.1 0.7
21.9	30.41 .28	59.2 0.9	46.15 .24	26.5 0.7	52.87 .26	33.6 1.0	13.77 .40	9.0 1.8	33.58 .22	5.4 0.4
31.9	30.69 .31	58.3 0.4	46.39 .28	25.8 0.3	53.13 .29	32.6 0.5	14.17 .45	7.2 1.2	33.80 .25	5.0 0.1
Apr. 10.8	31.00 .33	57.9 0.2	46.67 .29	25.5 0.3	53.42 .32	32.1 0.1	14.62 .49	6.0 0.6	34.05 .28	5.1 0.5
20.8	31.33 .35	58.1 0.7	46.96 .31	25.8 0.7	53.74 .33	32.2 0.6	15.11 .51	5.4 0.0	34.33 .29	5.6 0.9
30.8	31.68 .35	58.8 1.3	47.27 .32	26.5 1.2	54.07 .35	32.8 1.1	15.62 .53	5.4 0.7	34.62 .30	6.5 1.3
May 10.8	32.03 .36	60.1 1.7	47.59 .33	27.7 1.7	54.42 .34	33.9 1.6	16.15 .52	6.1 1.2	34.92 .31	7.8 1.6
20.7	32.39 .34	61.8 2.2	47.92 .32	29.4 2.0	54.76 .34	35.5 2.0	16.67 .50	7.3 1.8	35.23 .31	9.4 2.0
30.7	32.73 .33	64.0 2.5	48.24 .30	31.4 2.4	55.10 .32	37.5 2.4	17.17 .47	9.1 2.3	35.54 .29	11.4 2.2
June 9.7	33.06 .30	66.5 2.8	48.54 .28	33.8 2.6	55.42 .30	39.9 2.7	17.64 .43	11.4 2.7	35.83 .27	13.6 2.4
19.7	33.36 .26	69.3 3.1	48.82 .25	36.4 2.7	55.72 .26	42.6 2.9	18.07 .37	14.1 3.0	36.10 .25	16.0 2.4
29.6	33.62 .23	72.4 3.2	49.07 .21	39.1 2.9	55.98 .22	45.5 3.1	18.44 .30	17.1 3.3	36.35 .22	18.5 2.5
July 9.6	33.85 .17	75.6 3.2	49.28 .17	42.0 2.9	56.20 .18	48.6 3.2	18.74 .23	20.4 3.6	36.57 .18	21.0 2.6
19.6	34.02 .13	78.8 3.3	49.45 .13	44.9 2.9	56.38 .12	51.8 3.1	18.97 .15	24.0 3.6	36.75 .14	23.6 2.4
29.5	34.15 .07	82.1 3.1	49.58 .07	47.8 2.8	56.50 .08	54.9 3.1	19.12 .07	27.6 3.6	36.89 .09	26.0 2.4
Aug. 8.5	34.22 .03	85.2 3.1	49.65 .03	50.6 2.6	56.58 .03	58.0 3.0	19.19 .01	31.2 3.6	36.98 .04	28.4 2.1
18.5	34.25 .03	88.3 2.8	49.68 .03	53.2 2.4	56.61 .03	61.0 2.8	19.18 .09	34.8 3.4	37.02 .01	30.5 2.0
28.5	34.22 .08	91.1 2.6	49.66 .06	55.6 2.2	56.58 .08	63.8 2.5	19.09 .17	38.2 3.2	37.03 .05	32.5 1.7
Sept. 7.4	34.14 .12	93.7 2.2	49.60 .10	57.8 1.9	56.50 .12	66.3 2.2	18.92 .23	41.4 3.0	36.98 .08	34.2 1.5
17.4	34.02 .16	95.9 2.0	49.50 .14	59.7 1.5	56.38 .15	68.5 1.9	18.69 .30	44.4 2.7	36.90 .11	35.7 1.1
27.4	33.86 .18	97.9 1.5	49.36 .17	61.2 1.3	56.23 .19	70.4 1.5	18.39 .34	47.1 2.2	36.79 .14	36.8 0.9
Oct. 7.4	33.68 .21	99.4 1.1	49.19 .18	62.5 0.8	56.04 .20	71.9 1.1	18.05 .39	49.3 1.8	36.65 .16	37.7 0.6
17.3	33.47 .21	100.5 0.7	49.01 .19	63.3 0.4	55.84 .22	73.0 0.7	17.66 .41	51.1 1.3	36.49 .17	38.3 0.2
27.3	33.26 .22	101.2 0.2	48.82 .20	63.7 0.1	55.62 .22	73.7 0.2	17.25 .42	52.4 0.7	36.32	38.5 0.1
Nov. 6.3	33.04 .21	101.4 0.2	48.62 .19	63.8 0.4	55.40 .22	73.9 0.3	16.83 .43	53.1 0.2	36.15 .17	38.4 0.4
16.2	32.83 .20	101.2 0.5	48.43 .18	63.4 0.8	55.18 .20	73.6 0.7	16.40 .42	53.3 0.4	35.99 .16	38.0 0.7
26.2	32.63 .17	100.5 1.2	48.25 .15	62.6 1.1	54.98 .18	72.9 1.1	15.98 .39	52.9 0.9	35.84 .15	37.3 1.0
Dec. 6.2	32.46 .15	99.3 1.6	48.10 .14	61.5 1.5	54.80 .16	71.8 1.6	15.59 .36	52.0 1.6	35.70 .14	36.3 1.3
16.2	32.31 .12	97.7 1.9	47.96 .10	60.0 1.9	54.64 .13	70.2 1.9	15.23 .31	50.4 2.0	35.59 .09	35.0 1.5
26.1	32.19 .08	95.8 2.3	47.86 .07	58.1 2.1	54.51 .09	68.3 2.3	14.92 .26	48.4 2.4	35.50 .06	33.5 1.7
36.1	32.11	93.5	47.79	56.0	54.42	66.0	14.66	46.0	35.44	31.8

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Capricorni. Right Ascension.	ζ Capricorni. Declination South.	β Aquarii. Right Ascension.	β Aquarii. Declination South.	β Cephei (pr.). Right Ascension.	β Cephei (pr.). Declination North.	ξ Aquarii. Right Ascension.	ξ Aquarii. Declination South.	74 Cygni. Right Ascension.	74 Cygni. Declination North.
	h m 21 21	° ' −22 49	h m 21 26	° ' −5 59	h m 21 27	° ' +70 07	h m 21 32	° ' −8 17	h m 21 33	° ' +39 58
	s	''	s	''	s	''	s	''	s	''
Jan. 1.1	3.96 .02	67.4 0.3	23.73 .02	63.4 0.6	22.24 .36	70.4 2.6	31.85 .03	33.0 0.5	0.87 .09	39.4 2.3
11.1	3.94 .01	67.1 0.5	23.71 .00	64.0 0.6	21.88 .26	67.8 2.9	31.82 .00	33.5 0.4	0.78 .06	37.1 2.5
21.1	3.95 .05	66.6 0.5	23.71 .04	64.6 0.6	21.62 .16	64.9 3.2	31.82 .04	33.9 0.3	0.72 .02	34.6 2.6
31.0	4.00 .08	66.1 0.5	23.75 .07	65.0 0.4	21.46 .04	61.7 3.2	31.86 .06	34.2 0.2	0.70 .03	32.0 2.7
Feb. 10.0	4.08 .11	65.3 0.8	23.82 .10	65.3 0.2	21.42 .08	58.5 3.3	31.92 .09	34.4 0.0	0.73 .08	29.3 2.6
20.0	4.19 .15	64.5 1.0	23.92 .12	65.5 0.0	21.50 .19	55.2 3.2	32.01 .12	34.4 0.2	0.81 .12	26.7 2.4
Mar. 2.0	4.34 .17	63.5 1.2	24.04 .16	65.5 0.3	21.69 .31	52.0 2.8	32.13 .15	34.2 0.4	0.93 .16	24.3 2.1
11.9	4.51 .21	62.3 1.3	24.20 .19	65.2 0.4	22.00 .41	49.2 2.5	32.28 .19	33.8 0.6	1.09 .21	22.2 1.7
21.9	4.72 .24	61.0 1.4	24.39 .21	64.8 0.8	22.41 .50	46.7 2.1	32.47 .21	33.2 0.8	1.30 .25	20.5 1.2
31.9	4.96 .26	59.6 1.5	24.60 .24	64.0 0.9	22.91 .58	44.6 1.5	32.68 .24	32.4 1.1	1.55 .28	19.3 0.7
Apr. 10.9	5.22 .28	58.1 1.6	24.84 .26	63.1 1.2	23.49 .63	43.1 0.9	32.92 .26	31.3 1.2	1.83 .31	18.6 0.2
20.8	5.50 .30	56.5 1.6	25.10 .28	61.9 1.4	24.12 .68	42.2 0.2	33.18 .28	30.1 1.5	2.14 .34	18.4 0.3
30.8	5.80 .32	54.9 1.6	25.38 .30	60.5 1.5	24.80 .69	42.0 0.3	33.46 .29	28.6 1.6	2.48 .35	18.7 0.9
May 10.8	6.12 .32	53.3 1.5	25.68 .30	59.0 1.7	25.49 .69	42.3 1.0	33.75 .31	27.0 1.6	2.83 .36	19.6 1.4
20.7	6.44 .32	51.8 1.4	25.98 .30	57.3 1.7	26.18 .66	43.3 1.5	34.06 .30	25.4 1.7	3.19 .35	21.0 1.8
30.7	6.76 .31	50.4 1.3	26.28 .30	55.6 1.8	26.84 .63	44.8 2.1	34.36 .30	23.7 1.8	3.54 .34	22.8 2.3
June 9.7	7.07 .30	49.1 1.2	26.58 .28	53.8 1.7	27.47 .56	46.9 2.5	34.66 .28	21.9 1.6	3.88 .32	25.1 2.5
19.7	7.37 .28	47.9 0.9	26.86 .25	52.1 1.7	28.03 .49	49.4 2.9	34.94 .26	20.3 1.6	4.20 .29	27.6 2.9
29.6	7.65 .24	47.0 0.7	27.11 .23	50.4 1.5	28.52 .40	52.3 3.2	35.20 .24	18.7 1.5	4.49 .25	30.5 3.0
July 9.6	7.89 .21	46.3 0.5	27.34 .20	48.9 1.4	28.92 .31	55.5 3.5	35.44 .20	17.2 1.2	4.74 .20	33.5 3.2
19.6	8.10 .16	45.8 0.2	27.54 .15	47.5 1.2	29.23 .20	59.0 3.6	35.64 .17	16.0 1.1	4.94 .15	36.7 3.2
29.6	8.26 .12	45.6 0.0	27.69 .11	46.3 1.0	29.43 .09	62.6 3.7	35.81 .11	14.9 0.9	5.09 .11	39.9 3.1
Aug. 8.5	8.38 .07	45.6 0.2	27.80 .07	45.3 0.8	29.52 .01	66.3 3.7	35.92 .08	14.0 0.7	5.20 .05	43.0 3.1
18.5	8.45 .02	45.8 0.4	27.87 .02	44.5 0.5	29.51 .12	70.0 3.6	36.00 .03	13.3 0.4	5.25 .01	46.1 2.9
28.5	8.47 .02	46.2 0.6	27.89 .02	44.0 0.4	29.39 .22	73.6 3.4	36.03 .01	12.9 0.2	5.24 .05	49.0 2.7
Sept. 7.4	8.45 .07	46.8 0.7	27.87 .06	43.6 0.2	29.17 .32	77.0 3.2	36.02 .06	12.7 0.1	5.19 .10	51.7 2.5
17.4	8.38 .10	47.5 0.7	27.81 .09	43.4 0.0	28.85 .39	80.2 2.9	35.96 .09	12.6 0.1	5.09 .13	54.2 2.1
27.4	8.28 .14	48.2 0.8	27.72 .12	43.4 0.2	28.46 .47	83.1 2.5	35.87 .11	12.7 0.2	4.96 .17	56.3 1.7
Oct. 7.4	8.14 .15	49.0 0.8	27.60 .14	43.6 0.3	27.99 .53	85.6 2.1	35.76 .14	12.9 0.4	4.79 .20	58.0 1.3
17.3	7.99 .17	49.8 0.7	27.46 .15	43.9 0.4	27.46 .57	87.7 1.6	35.62 .15	13.3 0.5	4.59 .22	59.3 1.0
27.3	7.82 .17	50.5 0.7	27.31 .15	44.3 0.4	26.89 .60	89.3 1.0	35.47 .15	13.8 0.5	4.37 .22	60.3 0.4
Nov. 6.3	7.65 .16	51.2 0.5	27.16 .15	44.7 0.6	26.29 .62	90.3 0.5	35.32 .15	14.3 0.6	4.15 .22	60.7 0.0
16.3	7.49 .15	51.7 0.4	27.01 .13	45.3 0.6	25.67 .60	90.8 0.0	35.17 .13	14.9 0.6	3.93 .22	60.7 0.4
26.2	7.34 .13	52.1 0.3	26.88 .12	45.9 0.6	25.07 .59	90.8 0.7	35.04 .12	15.5 0.6	3.71 .20	60.3 1.0
Dec. 6.2	7.21 .10	52.4 0.1	26.76 .10	46.5 0.7	24.48 .54	90.1 1.3	34.92 .10	16.1 0.6	3.51 .18	59.3 1.4
16.2	7.11 .07	52.5 0.0	26.66 .07	47.2 0.7	23.94 .49	88.8 1.8	34.82 .07	16.7 0.6	3.33 .15	57.9 1.8
26.1	7.04 .04	52.5 0.2	26.59 .04	47.9 0.7	23.45 .41	87.0 2.3	34.75 .05	17.3 0.5	3.18 .12	56.1 2.1
36.1	7.00	52.3	26.55	48.5	23.04	84.7	34.70	17.8	3.06	54.0

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ¹ Octantis.		ε Pegasi.		11 Cephei.		π² Cygni.		μ Capricorni.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.
	h m 21 35	° ′ −83 09	h m 21 39	° ′ +9 25	h m 21 40	° ′ +70 51	h m 21 43	° ′ +48 51	h m 21 47	° ′ −14 00
	s	″	s	″	s	″	s	″	s	″
Jan. 1.1	46.35	77.0	22.16	41.0	27.76	57.8	9.90	39.9	56.95	44.9
11.1	45.56	74.0	22.12	39.7	27.36	55.4	9.76	37.5	56.91	45.1
21.1	45.07	70.7	22.10	38.4	27.06	52.6	9.66	34.8	56.90	45.1
31.1	44.88	67.2	22.12	37.1	26.86	49.5	9.61	32.0	56.92	45.1
Feb. 10.0	45.00	63.6	22.16	35.9	26.78	46.2	9.61	29.1	56.97	44.9
20.0	45.42	59.9	22.24	34.8	26.82	43.0	9.67	26.2	57.05	44.5
Mar. 2.0	46.12	56.3	22.35	33.9	26.98	39.8	9.78	23.5	57.16	43.9
11.9	47.09	52.9	22.49	33.3	27.26	36.9	9.95	21.1	57.30	43.2
21.9	48.30	49.7	22.66	33.0	27.65	34.3	10.17	19.0	57.47	42.3
31.9	49.72	46.7	22.87	33.0	28.14	32.1	10.44	17.4	57.67	41.1
Apr. 10.9	51.33	44.1	23.10	33.4	28.72	30.5	10.75	16.3	57.91	39.8
20.8	53.08	41.9	23.35	34.1	29.36	29.4	11.10	15.7	58.16	38.3
30.8	54.95	40.1	23.63	35.2	30.05	28.9	11.47	15.8	58.44	36.8
May 10.8	56.89	38.8	23.92	36.6	30.76	29.1	11.87	16.4	58.74	35.1
20.7	58.87	38.0	24.22	38.2	31.48	29.9	12.27	17.5	59.05	33.4
30.7	60.83	37.7	24.52	40.1	32.18	31.3	12.67	19.2	59.36	31.7
June 9.7	62.74	38.0	24.82	42.1	32.84	33.2	13.05	21.3	59.67	30.0
19.7	64.54	38.7	25.10	44.3	33.44	35.6	13.41	23.8	59.96	28.4
29.6	66.19	40.0	25.37	46.5	33.97	38.4	13.73	26.7	60.24	27.0
July 9.6	67.65	41.7	25.60	48.6	34.42	41.5	14.01	29.8	60.49	25.8
19.6	68.87	43.8	25.80	50.8	34.77	44.9	14.24	33.1	60.71	24.7
29.6	69.82	46.2	25.95	52.8	35.01	48.5	14.42	36.5	60.89	23.9
Aug. 8.5	70.46	48.9	26.07	54.7	35.15	52.2	14.54	39.9	61.03	23.3
18.5	70.78	51.8	26.14	56.4	35.17	55.9	14.60	43.3	61.12	23.0
28.5	70.76	54.8	26.17	57.8	35.09	59.5	14.60	46.5	61.17	22.8
Sept. 7.5	70.40	57.8	26.16	59.1	34.90	63.0	14.54	49.5	61.17	22.9
17.4	69.72	60.6	26.11	60.1	34.61	66.3	14.43	52.3	61.13	23.2
27.4	68.73	63.1	26.02	60.9	34.24	69.3	14.27	54.8	61.05	23.6
Oct. 7.4	67.48	65.3	25.91	61.4	33.78	72.0	14.07	56.9	60.95	24.1
17.3	66.01	67.0	25.77	61.7	33.26	74.3	13.85	58.6	60.82	24.7
27.3	64.38	68.3	25.63	61.7	32.69	76.1	13.59	59.9	60.67	25.4
Nov. 6.3	62.66	68.9	25.48	61.5	32.08	77.3	13.33	60.7	60.52	26.0
16.3	60.91	69.0	25.33	61.1	31.45	78.0	13.06	61.0	60.37	26.6
26.2	59.21	68.4	25.18	60.5	30.82	78.1	12.79	60.7	60.23	27.2
Dec. 6.2	57.61	67.2	25.06	59.6	30.21	77.7	12.54	60.0	60.11	27.8
16.2	56.18	65.4	24.95	58.6	29.64	76.6	12.31	58.7	60.00	28.3
26.2	54.96	63.1	24.86	57.5	29.11	74.9	12.11	57.0	59.92	28.7
36.1	54.00	60.4	24.80	56.2	28.66	72.8	11.94	54.8	59.86	28.9

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	16 Pegasi.		79 Draconis.		α Aquarii.		α Gruis.		π² Pegasi.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	h m 21 48	° ′ +25 27	h m 21 51	° ′ +73 14	h m 22 00	° ′ − 0 47	h m 22 02	° ′ −47 25	h m 22 05	° ′ +32 41
	s	″	s	″	s	″	s	″	s	″
Jan. 1.1	35.99 (.07)	63.5 (1.8)	36.87 (.49)	41.2 (2.3)	44.92 (.05)	39.6 (0.8)	2.69 (.10)	73.7 (1.4)	37.98 (.10)	65.1 (1.9)
11.1	35.92 (.04)	61.7 (2.0)	36.38 (.38)	38.9 (2.7)	44.87 (.03)	40.4 (0.7)	2.59 (.06)	72.3 (1.7)	37.88 (.07)	63.2 (2.1)
21.1	35.88 (.01)	59.7 (2.1)	36.00 (.28)	36.2 (3.1)	44.84 (.01)	41.1 (0.7)	2.53 (.01)	70.6 (2.0)	37.81 (.04)	61.1 (2.3)
31.1	35.87 (.03)	57.6 (2.0)	35.72 (.13)	33.1 (3.2)	44.85 (.03)	41.8 (0.6)	2.52 (.03)	68.6 (2.2)	37.77 (.00)	58.8 (2.3)
Feb. 10.0	35.90 (.06)	55.6 (1.9)	35.59 (.01)	29.9 (3.3)	44.88 (.06)	42.4 (0.5)	2.55 (.08)	66.4 (2.3)	37.77 (.04)	56.5 (2.2)
20.0	35.96 (.10)	53.7 (1.7)	35.58 (.14)	26.6 (3.2)	44.94 (.09)	42.9 (0.2)	2.63 (.12)	64.1 (2.5)	37.81 (.08)	54.3 (2.1)
Mar. 2.0	36.06 (.13)	52.0 (1.5)	35.72 (.28)	23.4 (3.0)	45.03 (.12)	43.1 (0.0)	2.75 (.16)	61.6 (2.5)	37.89 (.12)	52.2 (1.8)
12.0	36.19 (.17)	50.5 (1.2)	36.00 (.41)	20.4 (2.7)	45.15 (.15)	43.1 (0.2)	2.91 (.22)	59.1 (2.6)	38.01 (.17)	50.4 (1.5)
21.9	36.36 (.21)	49.3 (0.7)	36.41 (.52)	17.7 (2.3)	45.30 (.19)	42.9 (0.5)	3.13 (.25)	56.5 (2.6)	38.18 (.20)	48.9 (1.2)
31.9	36.57 (.24)	48.6 (0.3)	36.93 (.62)	15.4 (1.8)	45.49 (.22)	42.4 (0.8)	3.38 (.30)	53.9 (2.4)	38.38 (.24)	47.7 (0.6)
Apr. 10.9	36.81 (.27)	48.3 (0.2)	37.55 (.71)	13.6 (1.3)	45.71 (.24)	41.6 (1.1)	3.68 (.33)	51.5 (2.4)	38.62 (.27)	47.1 (0.2)
20.8	37.08 (.29)	48.5 (0.6)	38.26 (.76)	12.3 (0.6)	45.95 (.27)	40.5 (1.3)	4.01 (.36)	49.1 (2.2)	38.89 (.30)	46.9 (0.3)
30.8	37.37 (.31)	49.1 (1.1)	39.02 (.80)	11.7 (0.0)	46.22 (.28)	39.2 (1.5)	4.37 (.39)	46.9 (1.9)	39.19 (.32)	47.2 (0.8)
May 10.8	37.68 (.32)	50.2 (1.4)	39.82 (.81)	11.7 (0.6)	46.50 (.30)	37.7 (1.7)	4.76 (.41)	45.0 (1.7)	39.51 (.34)	48.0 (1.2)
20.7	38.00 (.32)	51.6 (1.8)	40.63 (.79)	12.3 (1.2)	46.80 (.30)	36.0 (1.9)	5.17 (.41)	43.3 (1.3)	39.85 (.34)	49.2 (1.7)
30.7	38.32 (.31)	53.4 (2.2)	41.42 (.75)	13.5 (1.7)	47.10 (.30)	34.1 (1.9)	5.58 (.41)	42.0 (1.0)	40.19 (.33)	50.9 (2.0)
June 9.7	38.63 (.30)	55.6 (2.4)	42.17 (.69)	15.2 (2.2)	47.40 (.29)	32.2 (1.9)	5.99 (.40)	41.0 (0.7)	40.52 (.31)	52.9 (2.3)
19.7	38.93 (.28)	58.0 (2.5)	42.86 (.62)	17.4 (2.7)	47.69 (.28)	30.3 (1.9)	6.39 (.38)	40.3 (0.2)	40.83 (.30)	55.2 (2.6)
29.6	39.21 (.24)	60.5 (2.7)	43.48 (.52)	20.1 (3.0)	47.97 (.24)	28.4 (1.8)	6.77 (.35)	40.1 (0.1)	41.13 (.27)	57.8 (2.8)
July 9.6	39.45 (.21)	63.2 (2.7)	44.00 (.42)	23.1 (3.3)	48.21 (.22)	26.6 (1.7)	7.12 (.31)	40.2 (0.6)	41.40 (.23)	60.6 (2.9)
19.6	39.66 (.17)	65.9 (2.7)	44.42 (.30)	26.4 (3.6)	48.43 (.18)	24.9 (1.6)	7.43 (.25)	40.8 (0.9)	41.63 (.19)	63.5 (2.9)
29.6	39.83 (.12)	68.6 (2.7)	44.72 (.18)	30.0 (3.7)	48.61 (.14)	23.3 (1.3)	7.68 (.20)	41.7 (1.2)	41.82 (.14)	66.4 (3.0)
Aug. 8.5	39.95 (.07)	71.3 (2.5)	44.90 (.06)	33.7 (3.7)	48.75 (.10)	22.0 (1.2)	7.88 (.14)	42.9 (1.5)	41.96 (.09)	69.4 (2.8)
18.5	40.02 (.03)	73.8 (2.3)	44.96 (.06)	37.4 (3.7)	48.85 (.06)	20.8 (0.9)	8.02 (.07)	44.4 (1.7)	42.05 (.05)	72.2 (2.7)
28.5	40.05 (.01)	76.1 (2.1)	44.90 (.19)	41.1 (3.5)	48.91 (.01)	19.9 (0.7)	8.09 (.01)	46.1 (1.9)	42.10 (.00)	74.9 (2.5)
Sept. 7.5	40.04 (.06)	78.2 (1.9)	44.71 (.30)	44.6 (3.4)	48.92 (.03)	19.2 (0.5)	8.10 (.05)	48.0 (2.0)	42.10 (.05)	77.4 (2.2)
17.4	39.98 (.09)	80.1 (1.6)	44.41 (.40)	48.0 (3.2)	48.89 (.07)	18.7 (0.2)	8.05 (.11)	50.0 (1.9)	42.05 (.09)	79.6 (2.0)
27.4	39.89 (.12)	81.7 (1.2)	44.01 (.49)	51.2 (2.8)	48.82 (.09)	18.5 (0.1)	7.94 (.15)	51.9 (1.9)	41.96 (.12)	81.6 (1.7)
Oct. 7.4	39.77 (.15)	82.9 (0.9)	43.52 (.57)	54.0 (2.4)	48.73 (.12)	18.4 (0.1)	7.79 (.19)	53.8 (1.6)	41.84 (.14)	83.3 (1.3)
17.4	39.62 (.16)	83.8 (0.6)	42.95 (.64)	56.4 (2.0)	48.61 (.13)	18.5 (0.3)	7.60 (.23)	55.4 (1.5)	41.70 (.17)	84.6 (0.9)
27.3	39.46 (.17)	84.4 (0.3)	42.31 (.68)	58.4 (1.5)	48.48 (.14)	18.8 (0.4)	7.37 (.23)	56.9 (1.1)	41.53 (.18)	85.5 (0.6)
Nov. 6.3	39.29 (.17)	84.7 (0.2)	41.63 (.71)	59.9 (0.9)	48.34 (.14)	19.2 (0.5)	7.14 (.25)	58.0 (0.8)	41.35 (.18)	86.1 (0.1)
16.3	39.12 (.17)	84.5 (0.5)	40.92 (.72)	60.8 (0.3)	48.20 (.14)	19.7 (0.6)	6.89 (.23)	58.8 (0.4)	41.17 (.18)	86.2 (0.2)
26.2	38.95 (.15)	84.0 (0.8)	40.20 (.71)	61.1 (0.3)	48.06 (.12)	20.3 (0.7)	6.66 (.22)	59.2 (0.0)	40.99 (.18)	86.0 (0.7)
Dec. 6.2	38.80 (.14)	83.2 (1.2)	39.49 (.68)	60.8 (0.9)	47.94 (.11)	21.0 (0.8)	6.44 (.20)	59.2 (0.4)	40.81 (.16)	85.3 (1.1)
16.2	38.66 (.11)	82.0 (1.4)	38.81 (.62)	59.9 (1.4)	47.83 (.09)	21.8 (0.8)	6.24 (.16)	58.8 (0.8)	40.65 (.14)	84.2 (1.4)
26.2	38.55 (.09)	80.6 (1.7)	38.19 (.56)	58.5 (2.0)	47.74 (.07)	22.6 (0.8)	6.08 (.12)	58.0 (1.1)	40.51 (.12)	82.8 (1.8)
36.1	38.46	78.9	37.63	56.5	47.67	23.4	5.96	56.9	40.39	81.0

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Aquarii. Right Ascension.		θ Aquarii. Declination South.		ν Octantis. Right Ascension.		ν Octantis. Declination South.		γ Aquarii. Right Ascension.		γ Aquarii. Declination South.		π Aquarii. Right Ascension.		π Aquarii. Declination North.		σ Aquarii. Right Ascension.		σ Aquarii. Declination South.	
	h m 22 11		° ′ − 8 15		h m 22 12		° ′ −86 27		h m 22 16		° ′ − 1 52		h m 22 20		° ′ + 0 52		h m 22 25		° ′ −11 10	
	s		″		s		″		s		″		s		″		s		″	
Jan. 1.2	39.65	.06	73.0	0.4	43.23	2.15	66.5	2.8	35.62	.06	46.8	0.7	16.29	.06	54.1	0.9	27.63	.07	43.6	0.3
11.1	39.59	.03	73.4	0.4	41.08	1.63	63.7	3.2	35.56	.04	47.5	0.7	16.23	.04	53.2	0.8	27.56	.04	43.9	0.2
21.1	39.56	.01	73.8	0.3	39.45	1.07	60.5	3.4	35.52	.01	48.2	0.6	16.19	.02	52.4	0.7	27.52	.02	44.1	0.1
31.1	39.55	.02	74.1	0.1	38.38	0.49	57.1	3.7	35.51	.02	48.8	0.5	16.17	.01	51.7	0.7	27.50	.01	44.2	0.0
Feb. 10.0	39.57	.05	74.2	0.1	37.89	0.08	53.4	3.7	35.53	.04	49.3	0.3	16.18	.04	51.0	0.5	27.51	.04	44.2	0.3
20.0	39.62	.08	74.1	0.2	37.97	0.65	49.7	3.8	35.57	.08	49.6	0.2	16.22	.07	50.5	0.3	27.55	.07	43.9	0.4
Mar. 2.0	39.70	.12	73.9	0.4	38.62	1.19	45.9	3.7	35.65	.10	49.8	0.1	16.29	.10	50.2	0.1	27.62	.10	43.5	0.6
12.0	39.82	.15	73.5	0.7	39.81	1.69	42.2	3.6	35.75	.14	49.7	0.3	16.39	.14	50.1	0.2	27.72	.13	42.9	0.9
21.9	39.97	.17	72.8	0.9	41.50	2.15	38.6	3.3	35.89	.18	49.4	0.6	16.53	.17	50.3	0.4	27.85	.17	42.0	1.1
31.9	40.14	.21	71.9	1.1	43.65	2.56	35.3	3.0	36.07	.20	48.8	0.8	16.70	.20	50.7	0.7	28.02	.20	40.9	1.3
Apr. 10.9	40.35	.24	70.8	1.4	46.21	2.91	32.3	2.6	36.27	.23	48.0	1.1	16.90	.23	51.4	1.0	28.22	.23	39.6	1.4
20.9	40.59	.27	69.4	1.5	49.12	3.20	29.7	2.2	36.50	.26	46.9	1.4	17.13	.26	52.4	1.3	28.45	.25	38.2	1.7
30.8	40.86	.28	67.9	1.7	52.32	3.42	27.5	1.8	36.76	.28	45.5	1.5	17.39	.27	53.7	1.5	28.70	.28	36.5	1.7
May 10.8	41.14	.30	66.2	1.7	55.74	3.57	25.7	1.3	37.04	.30	44.0	1.8	17.66	.30	55.2	1.6	28.98	.30	34.8	1.8
20.8	41.44	.30	64.5	1.8	59.31	3.63	24.4	0.7	37.34	.30	42.2	1.8	17.96	.30	56.8	1.9	29.28	.31	33.0	1.9
30.7	41.74	.31	62.7	1.9	62.94	3.60	23.7	0.2	37.64	.30	40.4	1.9	18.26	.30	58.7	1.9	29.59	.31	31.1	1.8
June 9.7	42.05	.30	60.8	1.8	66.54	3.50	23.5	0.3	37.94	.30	38.5	1.9	18.56	.30	60.6	2.0	29.90	.31	29.3	1.8
19.7	42.35	.28	59.0	1.7	70.04	3.30	23.8	0.9	38.24	.28	36.6	1.9	18.86	.28	62.6	2.0	30.20	.30	27.5	1.7
29.7	42.63	.26	57.3	1.5	73.34	3.01	24.7	1.3	38.52	.26	34.7	1.8	19.14	.26	64.6	1.9	30.49	.29	25.8	1.5
July 9.6	42.89	.23	55.8	1.4	76.35	2.64	26.0	1.9	38.78	.23	32.9	1.7	19.40	.23	66.5	1.8	30.76	.24	24.3	1.2
19.6	43.12	.20	54.4	1.2	78.99	2.17	27.9	2.2	39.01	.20	31.2	1.5	19.63	.20	68.3	1.6	31.00	.21	23.1	1.1
29.6	43.32	.15	53.2	1.0	81.16	1.65	30.1	2.6	39.21	.15	29.7	1.4	19.83	.16	69.9	1.5	31.21	.17	22.0	0.9
Aug. 8.6	43.47	.11	52.2	0.7	82.81	1.07	32.7	2.9	39.36	.11	28.3	1.1	19.99	.11	71.4	1.3	31.38	.13	21.1	0.5
18.5	43.58	.07	51.5	0.5	83.88	0.44	35.6	3.0	39.47	.07	27.2	0.9	20.10	.08	72.7	1.0	31.51	.08	20.6	0.4
28.5	43.65	.02	51.0	0.2	84.32	0.21	38.6	3.0	39.54	.03	26.3	0.6	20.18	.03	73.7	0.8	31.59	.03	20.2	0.1
Sept. 7.5	43.67	.02	50.8	0.1	84.11	0.85	41.6	3.0	39.57	.01	25.7	0.4	20.21	.01	74.5	0.6	31.62	.00	20.1	0.1
17.4	43.65	.05	50.7	0.1	83.26	1.48	44.6	2.8	39.56	.05	25.3	0.2	20.20	.05	75.1	0.4	31.62	.04	20.2	0.3
27.4	43.60	.09	50.8	0.3	81.78	2.05	47.4	2.6	39.51	.08	25.1	0.1	20.15	.08	75.5	0.2	31.58	.08	20.5	0.5
Oct. 7.4	43.51	.11	51.1	0.5	79.73	2.54	50.0	2.1	39.43	.11	25.0	0.2	20.07	.10	75.7	0.1	31.50	.10	21.0	0.5
17.4	43.40	.12	51.6	0.5	77.19	2.96	52.1	1.7	39.32	.12	25.2	0.3	19.97	.12	75.6	0.2	31.40	.12	21.5	0.7
27.3	43.28	.14	52.1	0.6	74.23	3.24	53.8	1.1	39.20	.13	25.5	0.4	19.85	.13	75.4	0.3	31.28	.13	22.2	0.7
Nov. 6.3	43.14	.14	52.7	0.6	70.99	3.42	54.9	0.5	39.07	.13	25.9	0.5	19.72	.14	75.1	0.5	31.15	.14	22.9	0.7
16.3	43.00	.14	53.3	0.6	67.57	3.46	55.4	0.1	38.93	.14	26.4	0.7	19.58	.13	74.6	0.6	31.01	.14	23.6	0.7
26.3	42.86	.12	53.9	0.7	64.11	3.37	55.3	0.8	38.80	.13	27.1	0.7	19.45	.13	74.0	0.7	30.87	.14	24.3	0.7
Dec. 6.2	42.74	.12	54.6	0.6	60.74	3.16	54.5	1.4	38.67	.11	27.8	0.7	19.32	.11	73.3	0.8	30.74	.13	25.0	0.6
16.2	42.62	.09	55.2	0.6	57.58	2.84	53.1	2.0	38.56	.10	28.5	0.8	19.21	.10	72.5	0.8	30.62	.12	25.6	0.5
26.2	42.53	.07	55.8	0.6	54.74	2.43	51.1	2.5	38.46	.08	29.3	0.8	19.11	.09	71.7	0.9	30.52	.10	26.1	0.5
36.1	42.46		56.4		52.31		48.6		38.38		30.1		19.02		70.8		30.44		26.6	

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Lacertæ. Right Ascension.	α Lacertæ. Declination North.	η Aquarii. Right Ascension.	η Aquarii. Declination South.	226 Cephei (B.). Right Ascension.	226 Cephei (B.). Declination North.	10 Lacertæ. Right Ascension.	10 Lacertæ. Declination North.	β Octantis. Right Ascension.	β Octantis. Declination South.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	22 27	+49 46	22 30	− 0 36	22 30	+75 43	22 34	+38 32	22 35	−81 53
	s	″	s	″	s	″	s	″	s	″
Jan. 1.2	15.18 (.19)	62.1 (1.9)	19.26 (.07)	76.1 (0.8)	32.39 (.67)	40.5 (1.8)	51.90 (.14)	41.2 (1.8)	56.97 (1.01)	53.9 (2.4)
11.1	14.99 (.15)	60.2 (2.3)	19.19 (.05)	76.9 (0.8)	31.72 (.58)	38.7 (2.3)	51.76 (.11)	39.4 (2.1)	55.96 (0.82)	51.5 (2.9)
21.1	14.84 (.11)	57.9 (2.6)	19.14 (.03)	77.6 (0.7)	31.14 (.45)	36.4 (2.7)	51.65 (.08)	37.3 (2.2)	55.14 (0.59)	48.6 (3.2)
31.1	14.73 (.06)	55.3 (2.8)	19.11 (.00)	78.2 (0.6)	30.69 (.32)	33.7 (3.0)	51.57 (.04)	35.1 (2.4)	54.55 (0.35)	45.4 (3.5)
Feb. 10.1	14.67 (.01)	52.5 (2.8)	19.11 (.03)	78.8 (0.6)	30.37 (.15)	30.7 (3.2)	51.53 (.00)	32.7 (2.4)	54.20 (0.11)	41.9 (3.7)
20.0	14.66 (.05)	49.7 (2.7)	19.14 (.07)	79.2 (0.2)	30.22 (.00)	27.5 (3.2)	51.53 (.04)	30.3 (2.4)	54.09 (0.13)	38.2 (3.7)
Mar. 2.0	14.71 (.11)	47.0 (2.6)	19.21 (.09)	79.4 (0.0)	30.22 (.17)	24.3 (3.2)	51.57 (.09)	27.9 (2.1)	54.22 (0.37)	34.5 (3.7)
12.0	14.82 (.16)	44.4 (2.3)	19.30 (.12)	79.4 (0.2)	30.39 (.33)	21.1 (2.9)	51.66 (.14)	25.8 (1.9)	54.59 (0.60)	30.8 (3.6)
21.9	14.98 (.22)	42.1 (1.9)	19.42 (.16)	79.2 (0.6)	30.72 (.48)	18.2 (2.7)	51.80 (.18)	23.9 (1.5)	55.19 (0.81)	27.2 (3.5)
31.9	15.20 (.28)	40.2 (1.5)	19.58 (.20)	78.6 (0.7)	31.20 (.62)	15.5 (2.2)	51.98 (.23)	22.4 (1.1)	56.00 (1.00)	23.7 (3.3)
Apr. 10.9	15.48 (.32)	38.7 (1.0)	19.78 (.22)	77.9 (1.1)	31.82 (.74)	13.3 (1.7)	52.21 (.27)	21.3 (0.6)	57.00 (1.17)	20.4 (2.9)
20.9	15.80 (.36)	37.7 (0.4)	20.00 (.25)	76.8 (1.3)	32.56 (.82)	11.6 (1.2)	52.48 (.31)	20.7 (0.1)	58.17 (1.33)	17.5 (2.5)
30.8	16.16 (.38)	37.3 (0.1)	20.25 (.28)	75.5 (1.5)	33.38 (.89)	10.4 (0.6)	52.79 (.32)	20.6 (0.4)	59.50 (1.45)	15.0 (2.2)
May 10.8	16.54 (.41)	37.4 (0.7)	20.53 (.28)	74.0 (1.7)	34.27 (.93)	9.8 (0.1)	53.11 (.35)	21.0 (0.9)	60.95 (1.54)	12.8 (1.6)
20.8	16.95 (.41)	38.1 (1.3)	20.81 (.30)	72.3 (1.9)	35.20 (.94)	9.9 (0.6)	53.46 (.36)	21.9 (1.3)	62.49 (1.60)	11.2 (1.2)
30.8	17.36 (.41)	39.4 (1.7)	21.11 (.31)	70.4 (1.9)	36.14 (.91)	10.5 (1.2)	53.82 (.36)	23.2 (1.8)	64.09 (1.62)	10.0 (0.6)
June 9.7	17.77 (.40)	41.1 (2.1)	21.42 (.30)	68.5 (2.0)	37.05 (.87)	11.7 (1.8)	54.18 (.35)	25.0 (2.2)	65.71 (1.60)	9.4 (0.1)
19.7	18.17 (.37)	43.2 (2.5)	21.72 (.29)	66.5 (1.9)	37.92 (.80)	13.5 (2.2)	54.53 (.33)	27.2 (2.5)	67.31 (1.54)	9.3 (0.4)
29.7	18.54 (.33)	45.7 (2.9)	22.01 (.27)	64.6 (1.9)	38.72 (.71)	15.7 (2.7)	54.86 (.30)	29.7 (2.7)	68.85 (1.43)	9.7 (1.0)
July 9.6	18.87 (.29)	48.6 (3.1)	22.28 (.24)	62.7 (1.7)	39.43 (.61)	18.4 (3.0)	55.16 (.26)	32.4 (2.9)	70.28 (1.29)	10.7 (1.5)
19.6	19.16 (.24)	51.7 (3.2)	22.52 (.20)	61.0 (1.6)	40.04 (.48)	21.4 (3.3)	55.42 (.23)	35.3 (3.0)	71.57 (1.10)	12.2 (1.9)
29.6	19.40 (.19)	54.9 (3.4)	22.72 (.17)	59.4 (1.4)	40.52 (.35)	24.7 (3.5)	55.65 (.18)	38.3 (3.0)	72.67 (0.89)	14.1 (2.4)
Aug. 8.6	19.59 (.13)	58.3 (3.4)	22.89 (.12)	58.0 (1.2)	40.87 (.22)	28.2 (3.7)	55.83 (.13)	41.3 (3.1)	73.56 (0.64)	16.5 (2.6)
18.5	19.72 (.07)	61.7 (3.3)	23.01 (.08)	56.8 (1.0)	41.09 (.08)	31.9 (3.8)	55.96 (.07)	44.4 (2.9)	74.20 (0.36)	19.1 (2.9)
28.5	19.79 (.01)	65.0 (3.2)	23.09 (.04)	55.8 (0.7)	41.17 (.06)	35.7 (3.7)	56.03 (.04)	47.3 (2.8)	74.56 (0.09)	22.0 (3.0)
Sept. 7.5	19.80 (.05)	68.2 (3.0)	23.13 (.00)	55.1 (0.5)	41.11 (.19)	39.4 (3.6)	56.07 (.02)	50.1 (2.6)	74.65 (0.20)	25.0 (3.0)
17.5	19.75 (.09)	71.2 (2.8)	23.13 (.03)	54.6 (0.3)	40.92 (.32)	43.0 (3.5)	56.05 (.06)	52.7 (2.4)	74.45 (0.49)	28.0 (3.0)
27.4	19.66 (.14)	74.0 (2.4)	23.10 (.07)	54.3 (0.1)	40.60 (.44)	46.5 (3.2)	55.99 (.10)	55.1 (2.1)	73.96 (0.74)	31.0 (3.0)
Oct. 7.4	19.52 (.18)	76.4 (2.2)	23.03 (.09)	54.2 (0.1)	40.16 (.55)	49.7 (2.8)	55.89 (.13)	57.2 (1.7)	73.22 (0.98)	33.7 (2.7)
17.4	19.34 (.22)	78.6 (1.7)	22.94 (.12)	54.3 (0.2)	39.61 (.64)	52.5 (2.5)	55.76 (.15)	58.9 (1.3)	72.24 (1.17)	36.1 (2.4)
27.3	19.12 (.23)	80.3 (1.3)	22.82 (.13)	54.5 (0.4)	38.97 (.71)	55.0 (2.1)	55.61 (.18)	60.2 (1.0)	71.07 (1.33)	38.0 (1.9)
Nov. 6.3	18.89 (.25)	81.6 (0.8)	22.69 (.13)	54.9 (0.6)	38.26 (.78)	57.1 (1.5)	55.43 (.19)	61.2 (0.6)	69.74 (1.42)	39.5 (1.5)
16.3	18.64 (.26)	82.4 (0.2)	22.56 (.13)	55.5 (0.6)	37.48 (.82)	58.6 (0.9)	55.24 (.19)	61.8 (0.1)	68.32 (1.46)	40.4 (0.9)
26.3	18.38 (.25)	82.6 (0.2)	22.43 (.13)	56.1 (0.6)	36.66 (.83)	59.5 (0.4)	55.05 (.19)	61.9 (0.4)	66.86 (1.45)	40.7 (0.3)
Dec. 6.2	18.13 (.25)	82.4 (0.8)	22.30 (.11)	56.8 (0.7)	35.83 (.82)	59.9 (0.3)	54.86 (.19)	61.5 (0.8)	65.41 (1.39)	40.3 (0.4)
16.2	17.88 (.23)	81.6 (1.2)	22.19 (.10)	57.5 (0.8)	35.01 (.79)	59.6 (0.9)	54.67 (.17)	60.7 (1.2)	64.02 (1.28)	39.3 (1.0)
26.2	17.65 (.21)	80.4 (1.7)	22.09 (.09)	58.3 (0.8)	34.22 (.79)	58.7 (0.9)	54.50 (.16)	59.5 (1.6)	62.74 (1.12)	37.8 (1.5)
36.2	17.44	78.7	22.00	59.1	33.49 (.73)	57.2 (1.5)	54.34	57.9	61.62	35.7 (2.1)

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Pegasi. Right Ascension.	ζ Pegasi. Declination North.	λ Pegasi. Right Ascension.	λ Pegasi. Declination North.	ι Cephei. Right Ascension.	ι Cephei. Declination North.	λ Aquarii. Right Ascension.	λ Aquarii. Declination South.	α Piscis Australis. (Fomalhaut.) Right Ascension.	α Piscis Australis. (Fomalhaut.) Declination South.
	h m 22 36	° ' +10 19	h m 22 41	° ' +23 02	h m 22 46	° ' +65 40	h m 22 47	° ' − 8 05	h m 22 52	° ' −30 08
	s	"	s	"	s	"	s	"	s	"
Jan. 1.2	34.55 .08	19.5 1.1	48.75 .10	72.0 1.5	11.42 .38	88.2 1.7	30.18 .08	61.3 0.5	14.02 .10	33.9 0.3
11.1	34.47 .06	18.4 1.2	48.65 .08	70.5 1.6	11.04 .33	86.5 2.2	30.10 .06	61.8 0.4	13.92 .08	33.6 0.7
21.1	34.41 .04	17.2 1.2	48.57 .05	68.9 1.7	10.71 .26	84.3 2.6	30.04 .04	62.2 0.3	13.84 .05	32.9 0.9
31.1	34.37 .01	16.0 1.2	48.52 .03	67.2 1.8	10.45 .19	81.7 2.9	30.00 .02	62.5 0.1	13.79 .03	32.0 1.1
Feb. 10.1	34.36 .02	14.9 1.1	48.49 .01	65.4 1.7	10.26 .10	78.8 3.1	29.98 .02	62.6 0.1	13.76 .01	30.9 1.4
20.0	34.38 .05	13.8 0.9	48.50 .04	63.7 1.6	10.16 .01	75.7 3.1	30.00 .04	62.5 0.3	13.77 .04	29.5 1.6
Mar. 2.0	34.43 .09	12.9 0.6	48.54 .08	62.1 1.3	10.15 .09	72.6 3.0	30.04 .08	62.2 0.5	13.81 .08	27.9 1.8
12.0	34.52 .12	12.3 0.4	48.62 .12	60.8 1.1	10.24 .19	69.6 2.9	30.12 .11	61.7 0.7	13.89 .12	26.1 2.0
22.0	34.64 .15	11.9 0.1	48.74 .15	59.7 0.8	10.43 .28	66.7 2.5	30.23 .15	61.0 0.9	14.01 .15	24.1 2.1
31.9	34.79 .19	11.8 0.3	48.89 .20	58.9 0.4	10.71 .36	64.2 2.1	30.38 .18	60.1 1.2	14.16 .19	22.0 2.2
Apr. 10.9	34.98 .23	12.1 0.6	49.09 .23	58.5 0.0	11.07 .44	62.1 1.7	30.56 .21	58.9 1.4	14.35 .23	19.8 2.2
20.9	35.21 .25	12.7 0.9	49.32 .26	58.5 0.4	11.51 .51	60.4 1.1	30.77 .24	57.5 1.6	14.58 .27	17.6 2.3
30.8	35.46 .27	13.6 1.2	49.58 .29	58.9 0.9	12.02 .55	59.3 0.5	31.01 .27	55.9 1.7	14.85 .29	15.3 2.2
May 10.8	35.73 .29	14.8 1.5	49.87 .31	59.8 1.2	12.57 .58	58.8 0.1	31.28 .29	54.2 1.8	15.14 .31	13.1 2.1
20.8	36.02 .31	16.3 1.8	50.18 .32	61.0 1.5	13.15 .60	58.9 0.6	31.57 .30	52.4 1.9	15.45 .34	11.0 2.0
30.8	36.33 .31	18.1 1.9	50.50 .32	62.5 1.9	13.75 .59	59.5 1.2	31.87 .31	50.5 1.9	15.79 .34	9.0 1.8
June 9.7	36.64 .30	20.0 2.1	50.82 .32	64.4 2.2	14.34 .58	60.7 1.8	32.18 .30	48.6 1.9	16.13 .34	7.2 1.5
19.7	36.94 .29	22.1 2.2	51.14 .30	66.6 2.3	14.92 .54	62.5 2.2	32.48 .30	46.7 1.8	16.47 .33	5.7 1.2
29.7	37.23 .27	24.3 2.2	51.44 .28	68.9 2.5	15.46 .49	64.7 2.6	32.78 .28	44.9 1.7	16.80 .31	4.5 1.0
July 9.7	37.50 .24	26.5 2.1	51.72 .25	71.4 2.5	15.95 .43	67.3 3.0	33.06 .25	43.2 1.5	17.11 .29	3.5 0.6
19.6	37.74 .21	28.6 2.1	51.97 .21	73.9 2.6	16.38 .36	70.3 3.3	33.31 .23	41.7 1.3	17.40 .25	2.9 0.2
29.6	37.95 .17	30.7 2.0	52.18 .18	76.5 2.5	16.74 .29	73.6 3.4	33.54 .18	40.4 1.0	17.65 .21	2.7 0.1
Aug. 8.6	38.12 .13	32.7 1.8	52.36 .13	79.0 2.4	17.03 .20	77.0 3.6	33.72 .14	39.4 0.8	17.86 .17	2.8 0.4
18.5	38.25 .08	34.5 1.6	52.49 .09	81.4 2.3	17.23 .11	80.6 3.7	33.86 .10	38.6 0.6	18.03 .12	3.2 0.7
28.5	38.33 .05	36.1 1.4	52.58 .04	83.7 2.0	17.34 .03	84.3 3.6	33.96 .06	38.0 0.3	18.15 .07	3.9 1.0
Sept. 7.5	38.38 .00	37.5 1.1	52.62 .01	85.7 1.9	17.37 .05	87.9 3.5	34.02 .02	37.7 0.1	18.22 .02	4.9 1.2
17.5	38.38 .03	38.6 0.9	52.63 .03	87.6 1.6	17.32 .14	91.4 3.4	34.04 .02	37.6 0.2	18.24 .02	6.1 1.4
27.4	38.35 .07	39.5 0.7	52.60 .07	89.2 1.4	17.18 .21	94.8 3.1	34.02 .06	37.8 0.3	18.22 .06	7.5 1.4
Oct. 7.4	38.28 .09	40.2 0.7	52.53 .10	90.6 1.0	16.97 .27	97.9 2.7	33.96 .08	38.1 0.4	18.16 .10	8.9 1.4
17.4	38.19 .11	40.6 0.2	52.43 .12	91.6 0.8	16.70 .33	100.6 2.4	33.88 .10	38.5 0.6	18.06 .13	10.4 1.4
27.4	38.08 .13	40.8 0.0	52.31 .13	92.4 0.4	16.37 .37	103.0 2.0	33.78 .12	39.1 0.7	17.93 .15	11.8 1.3
Nov. 6.3	37.95 .14	40.8 0.0	52.18 .15	92.8 0.4	16.00 .41	105.0 2.0	33.66 .12	39.8 0.7	17.78 .15	13.1 1.3
16.3	37.81 .14	40.6 0.2	52.03 .15	93.0 0.2	15.59 .44	106.4 1.4	33.53 .13	40.5 0.7	17.63 .15	14.2 1.1
26.3	37.68 .13	40.1 0.5	51.88 .15	92.8 0.2	15.15 .46	107.3 0.9	33.40 .13	41.2 0.7	17.47 .16	15.2 1.0
Dec. 6.2	37.55 .13	39.4 0.7	51.73 .15	92.3 0.5	14.69 .45	107.7 0.4	33.27 .13	41.9 0.7	17.31 .16	15.8 0.6
16.2	37.43 .12	38.6 0.8	51.59 .14	91.4 0.9	14.24 .43	107.4 0.3	33.15 .12	42.6 0.7	17.16 .15	16.3 0.5
26.2	37.32 .11	37.6 1.0	51.47 .12	90.4 1.0	13.81 .41	106.5 0.9	33.04 .11	43.3 0.7	17.02 .14	16.1 0.1
36.2	37.23 .09	36.5 1.0	51.35 .12	89.0 1.0	13.40 .41	105.1 1.4	32.95 .09	43.8 0.5	16.90 .12	16.2 0.1

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	υ Andromedæ.		α Pegasi. (*Markab.*)		φ Aquarii.		ο Cephei.		τ Pegasi.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m	° '	h m	° '	h m	° '	h m	° '	h m	° '
	22 57	+41 47	22 59	+14 40	23 09	− 6 34	23 14	+67 34	23 15	+23 12
	s	''	s	''	s	''	s	''	s	''
Jan. 1.2	24.92 .16	75.0 1.6	52.96 .10	50.3 1.2	15.00 .09	36.0 0.5	36.42 .44	54.1 1.4	47.50 .12	26.1 1.3
11.2	24.76 .14	73.4 2.0	52.86 .08	49.1 1.3	14.91 .08	36.5 0.5	35.98 .39	52.7 1.8	47.38 .10	24.8 1.4
21.1	24.62 .11	71.4 2.2	52.78 .06	47.8 1.3	14.83 .06	37.0 0.3	35.59 .34	50.9 2.4	47.28 .08	23.4 1.6
31.1	24.51 .08	69.2 2.4	52.72 .03	46.5 1.3	14.77 .03	37.3 0.2	35.25 .27	48.5 2.7	47.20 .06	21.8 1.6
Feb. 10.1	24.43 .03	66.8 2.5	52.69 .01	45.2 1.2	14.74 .01	37.5 0.0	34.98 .18	45.8 2.9	47.14 .03	20.2 1.6
20.1	24.40 .01	64.3 2.4	52.68 .03	44.0 1.1	14.73 .03	37.5 0.1	34.80 .08	42.9 3.1	47.11 .01	18.6 1.6
Mar. 2.0	24.41 .06	61.9 2.3	52.71 .06	42.9 0.9	14.76 .05	37.4 0.4	34.72 .02	39.8 3.1	47.12 .04	17.0 1.4
12.0	24.47 .12	59.6 2.0	52.77 .10	42.0 0.7	14.81 .09	37.0 0.7	34.74 .13	36.7 2.9	47.16 .08	15.6 1.1
22.0	24.59 .16	57.6 1.7	52.87 .13	41.3 0.3	14.90 .12	36.3 0.8	34.87 .23	33.8 2.7	47.24 .13	14.5 0.8
31.9	24.75 .21	55.9 1.4	53.00 .18	41.0 0.0	15.02 .16	35.5 1.1	35.10 .34	31.1 2.4	47.37 .16	13.7 0.5
Apr. 10.9	24.96 .26	54.5 0.9	53.18 .20	41.0 0.3	15.18 .20	34.4 1.3	35.44 .42	28.7 1.9	47.53 .21	13.2 0.2
20.9	25.22 .30	53.6 0.4	53.38 .24	41.3 0.7	15.38 .22	33.1 1.6	35.86 .50	26.8 1.5	47.74 .24	13.0 0.3
30.9	25.52 .34	53.2 0.1	53.62 .27	42.0 1.0	15.60 .26	31.5 1.7	36.36 .56	25.3 0.9	47.98 .27	13.3 0.6
May 10.8	25.86 .35	53.3 0.6	53.89 .29	43.0 1.3	15.86 .28	29.8 1.8	36.92 .61	24.4 0.3	48.25 .30	13.9 1.0
20.8	26.21 .37	53.9 1.1	54.18 .31	44.3 1.6	16.14 .29	28.0 1.9	37.53 .64	24.1 0.2	48.55 .31	14.9 1.4
30.8	26.58 .37	55.0 1.5	54.49 .31	45.9 1.9	16.43 .31	26.1 2.0	38.17 .64	24.3 0.9	48.86 .32	16.3 1.7
June 9.7	26.95 .37	56.5 2.0	54.80 .31	47.8 2.1	16.74 .31	24.1 2.0	38.81 .64	25.2 1.4	49.18 .32	18.0 2.0
19.7	27.32 .35	58.5 2.3	55.11 .30	49.9 2.2	17.05 .30	22.1 1.8	39.45 .61	26.6 1.8	49.50 .32	20.0 2.1
29.7	27.67 .33	60.8 2.6	55.41 .29	52.1 2.2	17.35 .29	20.3 1.8	40.06 .57	28.4 2.4	49.82 .30	22.1 2.4
July 9.7	28.00 .30	63.4 2.8	55.70 .25	54.3 2.3	17.64 .26	18.5 1.6	40.63 .51	30.8 2.7	50.12 .27	24.5 2.4
19.6	28.30 .26	66.2 3.0	55.95 .23	56.6 2.2	17.90 .24	16.9 1.4	41.14 .44	33.5 3.0	50.39 .25	26.9 2.5
29.6	28.56 .21	69.2 3.1	56.18 .19	58.8 2.2	18.14 .20	15.5 1.2	41.58 .37	36.5 3.3	50.64 .21	29.4 2.5
Aug. 8.6	28.77 .16	72.3 3.1	56.37 .15	61.0 2.0	18.34 .16	14.3 0.9	41.95 .28	39.8 3.5	50.85 .16	31.9 2.3
18.6	28.93 .10	75.4 3.1	56.52 .11	63.0 1.8	18.50 .12	13.4 0.6	42.23 .20	43.3 3.6	51.01 .13	34.2 2.3
28.5	29.03 .07	78.5 2.9	56.63 .07	64.8 1.7	18.62 .08	12.8 0.4	42.43 .11	46.9 3.7	51.14 .08	36.5 2.1
Sept. 7.5	29.10 .01	81.4 2.8	56.70 .02	66.5 1.4	18.70 .04	12.4 0.2	42.54 .01	50.6 3.6	51.22 .04	38.6 1.9
17.5	29.11 .03	84.2 2.6	56.72 .01	67.9 1.2	18.74 .00	12.2 0.0	42.55 .06	54.2 3.5	51.26 .01	40.5 1.7
27.5	29.08 .08	86.8 2.3	56.71 .05	69.1 0.9	18.74 .03	12.2 0.3	42.49 .15	57.7 3.3	51.27 .03	42.2 1.4
Oct. 7.4	29.00 .11	89.1 2.0	56.66 .07	70.0 0.7	18.71 .07	12.5 0.4	42.34 .23	61.0 3.0	51.24 .07	43.6 1.2
17.4	28.89 .15	91.1 1.6	56.59 .09	70.7 0.4	18.64 .09	12.9 0.6	42.11 .29	64.0 2.7	51.17 .09	44.8 0.9
27.4	28.74 .16	92.7 1.3	56.50 .12	71.1 0.2	18.55 .10	13.5 0.6	41.82 .36	66.7 2.3	51.08 .11	45.7 0.6
Nov. 6.3	28.58 .19	94.0 0.8	56.38 .12	71.3 0.0	18.45 .12	14.1 0.7	41.46 .40	69.0 1.9	50.97 .13	46.3 0.3
16.3	28.39 .20	94.8 0.4	56.26 .13	71.3 0.3	18.33 .12	14.8 0.8	41.06 .45	70.9 1.3	50.84 .13	46.6 0.0
26.3	28.19 .20	95.2 0.1	56.13 .14	71.0 0.6	18.21 .13	15.6 0.8	40.61 .47	72.2 0.7	50.71 .14	46.6 0.3
Dec. 6.3	27.99 .20	95.1 0.5	55.99 .13	70.4 0.7	18.08 .12	16.4 0.7	40.14 .48	72.9 0.2	50.57 .14	46.3 0.6
16.2	27.79 .19	94.6 1.0	55.86 .12	69.7 0.9	17.96 .11	17.1 0.7	39.66 .48	73.1 0.5	50.43 .14	45.7 0.9
26.2	27.60 .18	93.6 1.4	55.74 .10	68.8 0.9	17.85 .10	17.8 0.7	39.18 .47	72.6 0.5	50.29 .13	44.8 0.9
36.2	27.42	92.2	55.64	67.7 1.1	17.75	18.4 0.6	38.71	71.6 1.0	50.16	43.6 1.2

FIXED STARS, 1902.

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Piscium. Right Ascension.	θ Piscium. Declination North.	λ Andromedæ. Right Ascension.	λ Andromedæ. Declination North.	ι Piscium. Right Ascension.	ι Piscium. Declination North.	γ Cephei. Right Ascension.	γ Cephei. Declination North.	i' Aquarii. Right Ascension.	i' Aquarii. Declination South.
	h m 23 22	° ′ + 5 50	h · m 23 32	° ′ +45 55	h m 23 34	° ′ + 5 05	h m 23 35	° ′ +77 05	h m 23 39	° ′ −18 48
	s	″	s	″	s	″	s	″	s	″
Jan. 1.2	60.12 .10	32.9 0.9	46.58 .20	56.5 1.3	54.96 .11	48.2 0.9	20.44 0.85	31.8 0.9	7.37 .11	77.7 0.2
11.2	60.02 .09	32.0 0.9	46.38 .18	55.2 1.7	54.85 .09	47.3 0.9	19.59 0.79	30.9 1.5	7.26 .10	77.9 0.1
21.2	59.93 .07	31.1 0.9	46.20 .16	53.5 2.0	54.76 .08	46.4 0.8	18.80 0.70	29.4 2.1	7.16 .09	78.0 0.2
31.1	59.86 .04	30.2 0.8	46.04 .12	51.5 2.3	54.68 .05	45.6 0.8	18.10 0.57	27.3 2.5	7.07 .06	77.8 0.5
Feb. 10.1	59.82 .03	29.4 0.7	45.92 .09	49.2 2.4	54.63 .04	44.8 0.6	17.53 0.43	24.8 2.8	7.01 .04	77.3 0.7
20.1	59.79 .01	28.7 0.6	45.83 .04	46.8 2.5	54.59 .00	44.2 0.6	17.10 0.27	22.0 3.1	6.97	76.6
Mar. 2.0	59.80 .03	28.1 0.4	45.79 .01	44.3 2.4	54.59 .03	43.6 0.3	16.83 0.09	18.9 3.2	6.96 .01	75.7 0.9
12.0	59.83 .08	27.7 0.1	45.80 .07	41.9 2.3	54.62 .06	43.3 0.1	16.74 0.09	15.7 3.2	6.98 .02	74.5 1.2
22.0	59.91 .11	27.6 0.2	45.87 .13	39.6 2.1	54.68 .10	43.2 0.2	16.83 0.09	12.6 3.1	7.04 .06	73.2 1.3
Apr. 1.0	60.02 .15	27.8 0.4	46.00 .18	37.5 1.7	54.78 .13	43.4 0.4	17.11 0.28 0.46	9.6 3.0 2.7	7.13 .09 .14	71.6 1.6 1.8
10.9	60.17 .18	28.2 0.7	46.18 .24	35.8 1.3	54.91 .18	43.8 0.8	17.57 0.61	6.9 2.3	7.27 .17	69.8 1.9
20.9	60.35 .22	28.9 1.0	46.42 .29	34.5 0.8	55.09 .21	44.6 1.0	18.18 0.75	4.6 1.9	7.44 .21	67.9 2.1
30.9	60.57 .25	29.9 1.3	46.71 .32	33.7 0.4	55.30 .24	45.6 1.3	18.93 0.87	2.7 1.4	7.65 .24	65.8 2.1
May 10.9	60.82 .27	31.2 1.5	47.03 .36	33.3 0.1	55.54 .27	46.9 1.5	19.80 0.95	1.3 0.9	7.89 .27	63.7 2.2
20.8	61.09 .30	32.7 1.7	47.39 .38	33.4 0.7	55.81 .29	48.4 1.7	20.75 1.01	0.4 0.2	8.16 .30	61.5 2.2
30.8	61.39 .30	34.4 1.9	47.77 .40	34.1 1.1	56.10 .31	50.1 1.8	21.76 1.04	0.2 0.3	8.46 .31	59.3 2.1
June 9.8	61.69 .31	36.3 2.0	48.17 .40	35.2 1.1	56.41 .31	51.9 1.8	22.80 1.03	0.5 0.9	8.77 .32	57.2 1.9
19.7	62.00 .30	38.3 2.1	48.57 .39	36.7 1.5	56.72 .30	53.9 2.0	23.83 1.00	1.4 1.4	9.09 .31	55.3 1.8
29.7	62.30 .29	40.4 2.0	48.96 .37	38.7 2.0	57.02 .30	55.9 2.0	24.83 0.95	2.8 2.0	9.40 .31	53.5 1.5
July 9.7	62.59 .27	42.4 2.0	49.33 .35	41.0 2.3	57.32 .27	57.9 2.0	25.78 0.86	4.8 2.4	9.71 .29	52.0 1.3
19.6	62.86 .24	44.4 1.9	49.68 .30	43.6 2.6	57.59 .25	59.9 1.9	26.64 0.77	7.2 2.8	10.00 .27	50.7 1.0
29.6	63.10 .21	46.3 1.8	49.98 .27	46.4 2.8	57.84 .22	61.8 1.7	27.41 0.65	10.0 3.1	10.27 .23	49.7 0.7
Aug. 8.6	63.31 .17	48.1 1.6	50.25 .21	49.4 3.0	58.06 .18	63.5 1.5	28.06 0.52	13.1 3.4	10.50 .19	49.0 0.3
18.6	63.48 .13	49.7 1.3	50.46 .17	52.5 3.1	58.24 .14	65.0 1.4	28.58 0.38	16.5 3.6	10.69 .16	48.7 0.1
28.5	63.61 .09	51.0 1.2	50.63 .11	55.6 3.1	58.38 .10	66.4 1.1	28.96 0.24	20.1 3.7	10.85 .11	48.6 0.3
Sept. 7.5	63.70 .05	52.2 0.9	50.74 .07	58.7 3.1	58.48 .07	67.5 0.8	29.20 0.10	23.8 3.8	10.96 .07	48.9 0.6
17.5	63.75 .01	53.1 0.9	50.81 .01	61.6 2.9	58.55 .03	68.3 0.7	29.30 0.05	27.6 3.7	11.03 .07	49.5 0.8
27.5	63.76 .02	53.8 0.7	50.82 .01	64.4 2.8	58.58 .01	69.0 0.4	29.25 0.19	31.3 3.6	11.06 .03	50.3 0.9
Oct. 7.4	63.74 .05	54.3 0.5	50.79 .03	67.0 2.6	58.57 .04	69.4 0.2	29.06 0.33	34.9 3.4	11.05 .01	51.2 0.9
17.4	63.69 .07	54.5 0.2	50.71 .08	69.4 2.4	58.53 .07	69.6 0.0	28.73 0.46	38.3 3.1	11.01 .04	52.3 1.1
27.4	63.62 .09	54.5 0.0 0.1	50.60 .11	71.4 2.0 1.7	58.46 .08	69.6 0.2	28.27 0.58	41.4 2.8	10.94 .07 .10	53.5 1.2
Nov. 6.4	63.53 .11	54.4 0.1	50.45 .15	73.1 1.7	58.38 .10	69.4 0.4	27.69 0.67	44.2 2.3	10.84 .11	54.7 1.2
16.3	63.42 .12	54.0 0.4	50.28 .17	74.3 1.2	58.28 .11	69.0 0.5	27.02 0.77	46.5 1.8	10.73 .13	55.9 1.2
26.3	63.30 .12	53.6 0.4	50.09 .19	75.1 0.8	58.17 .12	68.5 0.6	26.25 0.83	48.3 1.3	10.60 .13	57.0 1.1
Dec. 6.3	63.18 .13	53.0 0.6	49.89 .20	75.5 0.4	58.05 .12	67.9 0.7	25.42 0.88	49.6 0.7	10.47 .13	57.9 0.9
16.3	63.05 .11	52.2 0.8	49.67 .22	75.4 0.1	57.93 .11	67.2 0.8	24.54 0.89	50.3 0.0	10.34 .13	58.7 0.8
26.2	62.94 .11	51.4 0.8	49.46 .21	74.8 0.6	57.82 .11	66.4 0.8	23.65 0.99	50.3 0.5	10.21 .12	59.3 0.6
36.2	62.83	50.5 0.9	49.25 .21	73.8 1.0	57.71	65.5 0.9	22.66	49.8 0.5	10.09	59.7 0.4

(CONSTANTS OF STRUVE AND PETERS.)

APPARENT·PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Sculptoris. Right Ascension.		Declination South.		γ¹ Octantis. Right Ascension.		Declination South.		Groombridge 4163. Right Ascension.		Declination North.		ω Piscium. Right Ascension.		Declination North.	
	h m 23 43		° ' −28 39		h m 23 46		° ' −82 33		h m 23 50		° ' +73 51		h m 23 54		° ' + 6 19	
	s		"		s		"		s		"		s		"	
Jan. 1.2	49.41	.13	86.4	0.0	16.56	1.47	63.1	1.6	4.73	.67	77.7	0.8	17.23	.11	20.6	0.8
11.2	49.28	.12	86.4	0.3	15.09	1.33	61.5	2.2	4.06	.64	76.9	1.4	17.12	.11	19.8	0.9
21.2	49.16	.10	86.1	0.7	13.76	1.14	59.3	2.7	3.42	.57	75.5	1.9	17.01	.09	18.9	0.9
31.1	49.06	.08	85.4	0.9	12.62	0.93	56.6	3.0	2.85	.48	73.6	2.4	16.92	.07	18.0	0.9
Feb. 10.1	48.98	.05	84.5	1.2	11.69	0.71	53.6	3.4	2.37	.38	71.2	2.7	16.85	.05	17.2	0.8
20.1	48.93	.02	83.3	1.5	10.98	0.46	50.2	3.6	1.99	.24	68.5	3.0	16.80	.03	16.5	0.7
Mar. 2.1	48.91	.02	81.8	1.7	10.52	0.21	46.6	3.8	1.75	.11	65.5	3.1	16.77	.01	16.0	0.5
12.0	48.93	.05	80.1	2.0	10.31	0.04	42.8	3.8	1.64	.03	62.4	3.1	16.78	.04	15.6	0.4
22.0	48.98	.09	78.1	2.1	10.35	0.30	39.0	3.8	1.67	.19	59.3	3.0	16.82	.08	15.5	0.1
Apr. 1.0	49.07	.14	76.0	2.2	10.65	0.54	35.2	3.7	1.86	.33	56.3	2.7	16.90	.12	15.6	0.1
11.0	49.21	.17	73.8	2.4	11.19	0.78	31.5	3.5	2.19	.46	53.6	2.4	17.02	.16	15.9	0.3
20.9	49.38	.22	71.4	2.5	11.97	1.00	28.0	3.2	2.65	.59	51.2	1.9	17.18	.20	16.6	0.7
30.9	49.60	.25	68.9	2.4	12.97	1.19	24.8	2.9	3.24	.68	49.3	1.5	17.38	.23	17.5	0.9
May 10.9	49.85	.28	66.5	2.4	14.16	1.37	21.9	2.5	3.92	.76	47.8	0.9	17.61	.26	18.7	1.2
20.8	50.13	.30	64.1	2.3	15.53	1.50	19.4	2.1	4.68	.82	46.9	0.4	17.87	.28	20.1	1.4
30.8	50.43	.33	61.8	2.1	17.03	1.61	17.3	1.5	5.50	.85	46.5	0.2	18.15	.30	21.8	1.7
June 9.8	50.76	.33	59.7	1.9	18.64	1.67	15.8	1.0	6.35	.86	46.7	0.8	18.45	.31	23.6	1.8
19.8	51.09	.34	57.8	1.7	20.31	1.70	14.8	0.5	7.21	.84	47.5	1.3	18.76	.31	25.6	2.0
29.7	51.43	.32	56.1	1.3	22.01	1.67	14.3	0.1	8.05	.81	48.8	1.8	19.07	.29	27.6	2.0
July 9.7	51.75	.31	54.8	1.0	23.68	1.59	14.4	0.7	8.86	.75	50.6	2.3	19.36	.29	29.6	2.0
19.7	52.06	.29	53.8	0.6	25.27	1.48	15.1	1.2	9.61	.67	52.9	2.7	19.65	.26	31.6	2.0
29.6	52.35	.25	53.2	0.2	26.75	1.30	16.3	1.7	10.28	.58	55.6	3.0	19.91	.23	33.5	1.9
Aug. 8.6	52.60	.21	53.0	0.1	28.05	1.09	18.0	2.2	10.86	.48	58.6	3.3	20.14	.20	35.2	1.7
18.6	52.81	.17	53.1	0.5	29.14	0.85	20.2	2.5	11.34	.38	61.9	3.5	20.34	.16	36.8	1.6
28.6	52.98	.12	53.6	0.8	29.99	0.57	22.7	2.9	11.72	.26	65.4	3.6	20.50	.12	38.2	1.4
Sept. 7.5	53.10	.08	54.4	1.1	30.56	0.26	25.6	3.0	11.98	.14	69.0	3.7	20.62	.08	39.4	1.2
17.5	53.18	.03	55.5	1.3	30.82	0.04	28.6	3.1	12.12	.03	72.7	3.7	20.70	.05	40.4	1.0
27.5	53.21	.01	56.8	1.5	30.78	0.35	31.7	3.1	12.15	.09	76.4	3.6	20.75	.01	41.1	0.7
Oct. 7.5	53.20	.05	58.3	1.7	30.43	0.66	34.8	2.9	12.06	.20	80.0	3.4	20.76	.02	41.6	0.5
17.4	53.15	.08	60.0	1.6	29.77	0.92	37.7	2.7	11.86	.30	83.4	3.1	20.74	.05	41.9	0.3
27.4	53.07	.10	61.6	1.5	28.85	1.17	40.4	2.3	11.56	.41	86.5	2.8	20.69	.07	41.9	0.0
Nov. 6.4	52.97	.13	63.1	1.5	27.68	1.36	42.7	1.8	11.15	.49	89.3	2.4	20.62	.09	41.8	0.1
16.4	52.84	.14	64.6	1.3	26.32	1.51	44.5	1.2	10.66	.56	91.7	1.9	20.53	.10	41.5	0.3
26.3	52.70	.15	65.9	1.0	24.81	1.59	45.7	0.7	10.10	.63	93.6	1.4	20.43	.11	41.1	0.4
Dec. 6.3	52.55	.15	66.9	0.8	23.22	1.63	46.4	0.0	9.47	.66	95.0	0.8	20.32	.12	40.5	0.6
16.3	52.40	.15	67.7	0.5	21.59	1.60	46.4	0.6	8.81	.69	95.8	0.2	20.20	.12	39.8	0.7
26.2	52.25	.14	68.2	0.5	19.99	1.53	45.8	1.3	8.12	.69	96.0	0.2	20.08	.11	39.0	0.8
36.2	52.11		68.4	0.2	18.46		44.5		7.43		95.6	0.4	19.97		38.2	0.8

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension. Mean Noon.	App. Noon.	Apparent Declination. Mean Noon.	App. Noon.	Hourly Motion. Right Ascen.	Declination.	Equation of Time for Apparent Noon.	Semidiameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Jan. 1	18 45 10.34	10.97	−23 02 38.2	37.5	11.046	+ 11.93	+ 3 31.24	16 17.13	1 11.01	18 41 39.17
2	18 49 35.22	35.96	22 57 38.3	37.5	11.031	13.07	3 59.59	16 17.12	1 10.97	18 45 35.73
3	18 53 59.82	60.64	22 52 10.9	9.9	11.017	14.21	4 27.64	16 17.12	1 10.92	18 49 32.28
4	18 58 24.05	24.95	22 46 16.2	15.0	11.002	15.34	4 55.30	16 17.11	1 10.87	18 53 28.84
5	19 02 47.91	48.88	22 39 54.3	52.9	10.985	16.47	5 22.60	16 17.09	1 10.81	18 57 25.40
6	19 07 11.34	12.39	−22 33 05.4	3.8	10.967	+ 17.59	+ 5 49.48	16 17.07	1 10.74	19 01 21.96
7	19 11 34.33	35.46	22 25 49.8	47.9	10.948	18.70	6 15.92	16 17.04	1 10.68	19 05 18.51
8	19 15 56.84	58.05	22 18 07.6	5.5	10.927	19.80	6 41.88	16 17.01	1 10.61	19 09 15.07
9	19 20 18.85	20.14	22 09 59.2	56.8	10.905	20.89	7 07.33	16 16.98	1 10.54	19 13 11.63
10	19 24 40.30	41.66	22 01 24.8	22.3	10.882	21.97	7 32.24	16 16.94	1 10.47	19 17 08.18
11	19 29 01.20	2.63	−21 52 24.6	21.7	10.859	+ 23.04	+ 7 56.59	16 16.90	1 10.40	19 21 04.74
12	19 33 21.51	23.01	21 42 58.8	55.6	10.833	24.09	8 20.34	16 16.86	1 10.32	19 25 01.30
13	19 37 41.20	42.77	21 33 07.8	4.3	10.807	25.14	8 43.49	16 16.81	1 10.23	19 28 57.85
14	19 42 00.23	1.87	21 22 51.9	48.1	10.779	26.17	9 05.97	16 16.75	1 10.14	19 32 54.41
15	19 46 18.61	20.31	21 12 11.2	7.1	10.751	27.20	9 27.78	16 16.69	1 10.05	19 36 50.97
16	19 50 36.30	38.06	−21 01 06.4	2.0	10.722	+ 28.20	+ 9 48.91	16 16.61	1 09.96	19 40 47.52
17	19 54 53.28	55.09	20 49 37.5	32.7	10.692	29.20	10 09.32	16 16.53	1 09.86	19 44 44.08
18	19 59 09.53	11.39	20 37 44.8	39.7	10.661	30.18	10 29.03	16 16.45	1 09.76	19 48 40.64
19	20 03 25.04	26.95	20 25 28.8	23.4	10.630	31.14	10 47.98	16 16.37	1 09.66	19 52 37.19
20	20 07 39.80	41.76	20 12 49.8	44.1	10.599	32.09	11 06.19	16 16.28	1 09.56	19 56 33.75
21	20 11 53.80	55.81	−19 59 48.1	42.0	10.567	+ 33.04	+ 11 23.63	16 16.19	1 09.46	20 00 30.31
22	20 16 07.03	9.07	19 46 24.0	17.5	10.535	33.96	11 40.29	16 16.09	1 09.35	20 04 26.86
23	20 20 19.47	21.56	19 32 37.8	30.9	10.502	34.87	11 56.17	16 15.99	1 09.24	20 08 23.42
24	20 24 31.13	33.26	19 18 30.0	22.8	10.470	35.77	12 11.28	16 15.88	1 09.13	20 12 19.97
25	20 28 42.00	44.16	19 03 60.7	53.3	10.437	36.66	12 25.59	16 15.77	1 09.03	20 16 16.53
26	20 32 52.09	54.29	− 18 49 10.6	2.8	10.404	+ 37.51	+ 12 39.12	16 15.65	1 08.92	20 20 13.08
27	20 37 01.39	3.62	18 33 59.8	51.6	10.371	38.37	12 51.86	16 15.53	1 08.81	20 24 09.64
28	20 41 09.89	12.15	18 18 28.8	20.2	10.338	39.21	13 03.78	16 15.41	1 08.70	20 28 06.20
29	20 45 17.59	19.87	18 02 37.9	29.0	10.304	40.02	13 14.93	16 15.28	1 08.59	20 32 02.75
30	20 49 24.49	26.80	17 46 27.6	18.4	10.271	40.83	13 25.26	16 15.15	1 08.48	20 35 59.31
31	20 53 30.59	32.91	−17 29 58.2	48.8	10.238	+ 41.62	+ 13 34.81	16 15.01	1 08.36	20 39 55.86
Feb. 1	20 57 35.88	38.21	17 13 10.1	0.4	10.204	42.38	13 43.54	16 14.87	1 08.24	20 43 52.42
2	21 01 40.37	42.71	16 55 63.8	53.8	10.170	43.14	13 51.47	16 14.72	1 08.12	20 47 48.97
3	21 05 44.06	46.41	16 38 39.6	29.4	10.136	43.87	13 58.60	16 14.57	1 08.00	20 51 45.53
4	21 09 46.94	49.30	16 20 58.0	47.6	10.103	44.59	14 04.91	16 14.42	1 07.89	20 55 42 08
5	21 13 49.02	51.39	−16 02 59.4	48.7	10.070	+ 45.29	+ 14 10.42	16 14.26	1 07.77	20 59 38.64
6	21 17 50.28	52.66	15 44 44.2	33.3	10.037	45.97	14 15.13	16 14.09	1 07.66	21 03 35.19
7	21 21 50.75	53.13	15 26 12.8	1.7	10.003	46.63	14 19.05	16 13.92	1 07.55	21 07 31.74
8	21 25 50.43	52 82	15 07 25.8	14.5	9.970	47.27	14 22.16	16 13.75	1 07.43	21 11 28.30
9	21 29 49.30	51.69	14 48 23.3	11.8	9.937	47.90	14 24.47	16 13.57	1 07.32	21 15 24.85
10	21 33 47.38	49.77	−14 28 66.2	54 5	9.904	+ 48.52	+ 14 25.99	16 13.39	1 07.21	21 19 21.41
11	21 37 44.67	47.05	14 09 34.5	22.6	9.871	49.10	14 26.72	16 13.21	1 07.10	21 23 17.96
12	21 41 41.17	43.54	13 49 48.9	36.9	9.838	49.68	14 26.65	16 13.02	1 06.99	21 27 14.52
13	21 45 36.90	39.25	13 29 49.6	37.5	9.806	50.24	14 25.81	16 12.83	1 06.88	21 31 11.07
14	21 49 31.86	34.20	13 09 37.2	25.0	9.774	50.78	14 24.21	16 12.64	1 06.77	21 35 07.62
15	21 53 26.04	28.38	− 12 48 72.2	59.9	9.742	+ 51.30	+ 14 21.83	16 12.44	1 06.67	21 39 04.18
16	21 57 19.48	21.80	− 12 28 34.8	22.4	9.711	+ 51.80	+ 14 18.72	16 12.24	1 06.56	21 43 00.73

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Feb. 16	21 57 19.48	21.80	−12 28 34.8	22.4	9.711	+51.80	+14 18.72	16 12.24	1 06.56	21 43 00.73
17	22 01 12.17	14.47	12 07 45.6	33.2	9.681	52.29	14 14.86	16 12.04	1 06.46	21 46 57.28
18	22 05 04.15	6.42	11 46 44.9	32.4	9.651	52.76	14 10.26	16 11.83	1 06.36	21 50 53.84
19	22 08 55.41	57.66	11 25 33.1	20.5	9.622	53.21	14 04.97	16 11.62	1 06.26	21 54 50.39
20	22 12 45.97	48.21	11 03 70.6	58.1	9.593	53.65	13 58.97	16 11.40	1 06.16	21 58 46.94
21	22 16 35.87	38.08	−10 42 37.9	25.4	9.565	+54.07	+13 52.30	16 11.18	1 06.06	22 02 43.50
22	22 20 25.11	27.30	10 20 55.1	42.6	9.538	54.47	13 44.99	16 10.96	1 05.97	22 06 40.05
23	22 24 13.71	15.88	9 58 62.8	50.3	9.512	54.86	13 37.03	16 10.74	1 05 88	22 10 36.60
24	22 28 01.70	3.84	9 36 61.5	49.0	9.487	55.24	13 28.46	16 10.52	1 05.79	22 14 33.16
25	22 31 49.10	51.21	9 14 51.3	38.9	9.463	55.59	13 19.30	16 10.29	1 05.71	22 18 29.71
26	22 35 35.92	37.99	−8 52 32.8	20.5	9.439	+55.93	+13 09.57	16 10.06	1 05.62	22 22 26.26
27	22 39 22.18	24.21	8 29 66.4	54.2	9.416	56.26	12 59.27	16 09.82	1 05.54	22 26 22.82
28	22 43 07.91	9.91	8 07 32.2	20.1	9.395	56.57	12 48.44	16 09.58	1 05.46	22 30 19.37
Mar. 1	22 46 53.11	55.08	7 44 50.9	39.0	9.374	56.86	12 37.09	16 09.34	1 05.38	22 34 15.92
2	22 50 37.81	39.75	7 21 62.9	51.0	9.353	57.14	12 25.24	16 09.10	1 05.31	22 38 12.47
3	22 54 22.03	23.93	−6 58 68.6	56.9	9.333	+57.39	+12 12.90	16 08.86	1 05.24	22 42 09.02
4	22 58 05.79	7.66	6 35 68.2	56.6	9.314	57.63	12 00.10	16 08.61	1 05.17	22 46 05.58
5	23 01 49.10	50.92	6 12 62.2	50.8	9.296	57.85	11 46.86	16 08.36	1 05.11	22 50 02.13
6	23 05 31.99	33.77	5 49 51.1	39.9	9.278	58.06	11 33.20	16 08.11	1 05.04	22 53 58.68
7	23 09 14.46	16.20	5 26 35.2	24.2	9.261	58.25	11 19.11	16 07.85	1 04.98	22 57 55.24
8	23 12 56.54	58.24	−5 03 14.9	4.1	9.245	+58.42	+11 04.64	16 07.60	1 04.92	23 01 51.79
9	23 16 38.24	39.90	4 39 50.5	40.0	9.230	58.58	10 49.79	16 07.34	1 04.87	23 05.48.34
10	23 20 19.58	21.20	4 16 22.6	12.3	9.215	58.73	10 34.59	16 07.08	1 04.82	23 09 44.89
11	23 24 00.57	2.15	3 52 51.5	41.4	9.201	58.85	10 19.03	16 06.82	1 04.77	23 13 41.44
12	23 27 41.23	42.77	3 29 17.6	7.9	9.187	58.96	10 03.13	16 06.56	1 04.72	23 17 38.00
13	23 31 21.57	23.08	−3 05 41.5	31.9	9.174	+59.05	+9 46.92	16 06.30	1 04.67	23 21 34.55
14	23 35 01.62	3.09	2 41 63.4	54.0	9.163	59.12	9 30.42	16 06.03	1 04.63	23 25 31.10
15	23 38 41.39	42.80	2 18 23.6	14.4	9.152	59.18	9 13.63	16 05.77	1 04.59	23 29 27.65
16	23 42 20.89	22.25	1 54 42.6	33.7	9.141	59.23	8 56.58	16 05.50	1 04.56	23 33 24.20
17	23 46 00.14	1.45	1 30 60.7	52.2	9.131	59.25	8 39.28	16 05.23	1 04.53	23 37 20.76
18	23 49 39.18	40.45	−1 07 18.3	10.1	9.122	+59.27	+8 21.77	16 04.96	1 04.50	23 41 17.31
19	23 53 18.01	19.24	0 43 35.8	27.8	9.115	59.27	8 04.05	16 04.69	1 04.48	23 45 13.86
20	23 56 56.67	57.85	−0 19 53.6	45.9	9.108	59.25	7 46.16	16 04.42	1 04.46	23 49 10.41
21	0 00 35.17	36.31	+0 03 48.2	55.6	9.102	59.22	7 28.11	16 04.14	1 04.44	23 53 06.96
22	0 04 13.55	14.64	0 27 29.0	36.2	9.097	59.18	7 09.94	16 03.87	1 04.42	23 57 03.52
23	0 07 51.82	52.86	+0 51 08.5	15.3	9.093	+59.12	+6 51.66	16 03.60	1 04.41	0 01 00.07
24	0 11 30.00	30.99	1 14 46.6	53.0	9.090	59.04	6 33.31	16 03.33	1 04.40	0 04 56.62
25	0 15 08.13	9.07	1 38 22.8	28.9	9.088	58.96	6 14.89	16 03.05	1 04.39	0 08 53.17
26	0 18 46.23	47.12	2 01 56.6	62.4	9.087	58.86	5 56.43	16 02.78	1 04.38	0 12 49.72
27	0 22 24.32	25.17	2 25 27.9	33.4	9.087	58.74	5 37.97	16 02.50	1 04.38	0 16 46.28
28	0 26 02.41	3.21	+2 48 56.2	61.4	9.088	+58.61	+5 19.52	16 02.22	1 04.38	0 20 42.83
29	0 29 40.54	41.30	3 12 21.1	26.1	9.090	58.47	5 01.10	16 01.94	1 04.39	0 24 39.38
30	0 33 18.71	19.42	3 35 42.5	47.2	9.093	58.30	4 42.73	16 01.67	1 04.39	0 28 35.93
31	0 36 56.98	57.64	3 58 59.9	64.3	9.097	58.13	4 24.44	16 01.39	1 04.40	0 32 32.48
32	0 40 35.34	35.96	4 22 13.0	17.1	9.101	57.95	4 06.24	16 01.12	1 04.41	0 36 29.04
33	0 44 13.81	14.39	+4 45 21.5	25.2	9.106	+57.75	+3 48.17	16 00.84	1 04.43	0 40 25.59
34	0 47 52.41	52.95	+5 08 24.9	28.3	9.111	+57.53	+3 30.23	16 00.56	1 04.45	0 44 22.14

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.18 from the sidereal interval.

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FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Apr. 1	0 40 35.34	35.96	+ 4 22 13.0	17.1	9.101	+ 57.95	+ 4 06.24	16 01.12	1 04.41	0 36 29.04
2	0 44 13.81	14.39	4 45 21.5	25.2	9.106	57.75	3 48.17	16 00.84	1 04.43	0 40 25.59
3	0 47 52.41	52.95	5 08 24.9	28.3	9.111	57.53	3 30.23	16 00.56	1 04.45	0 44 22.14
4	0 51 31.17	31.67	5 31 22.9	26.0	9.118	57.30	3 12.45	16 00.28	1 04.47	0 48 18.69
5	0 55 10.11	10.57	5 54 15.2	18.0	9.126	57.05	2 54.84	16 00.00	1 04.50	0 52 15.24
6	0 58 49.22	49.63	+ 6 17 01.3	3.8	9.134	+ 56.79	+ 2 37.40	15 59.73	1 04.53	0 56 11.80
7	1 02 28.55	28.91	6 39 40.9	43.2	9.143	56.51	2 20.17	15 59.45	1 04.56	1 00 08.35
8	1 06 08.09	8.40	7 02 13.8	15.8	9.152	56.21	2 03.17	15 59.18	1 04.60	1 04 04.90
9	1 09 47.86	48.13	7 24 39.6	41.3	9.162	55.91	1 46.39	15 58.91	1 04.64	1 08 01.45
10	1 13 27.86	28.08	7 46 57.7	59.1	9.172	55.59	1 29.84	15 58.64	1 04.68	1 11 58.00
11	1 17 08.12	8.30	+ 8 09 08.0	9.2	9.183	+ 55.26	+ 1 13.56	15 58.36	1 04.72	1 15 54.56
12	1 20 48.65	48.79	8 31 10.0	10.9	9.195	54.90	0 57.54	15 58.09	1 04.76	1 19 51.11
13	1 24 29.46	29.56	8 53 03.5	4.2	9.207	54.54	0 41.80	15 57.82	1 04.80	1 23 47.66
14	1 28 10.55	10.62	9 14 48.0	48.3	9.219	54.16	0 26.33	15 57.55	1 04.84	1 27 44.22
15	1 31 51.97	52.01	9 36 23.3	23.4	9.232	53.76	+ 0 11.20	15 57.29	1 04.89	1 31 40.77
16	1 35 33.72	33.71	+ 9 57 48.7	48.7	9.246	+ 53.36	− 0 03.61	15 57.02	1 04.94	1 35 37.32
17	1 39 15.81	15.76	10 19 04.2	4.1	9.261	52.94	0 18.08	15 56.76	1 04.99	1 39 33.88
18	1 42 58.24	58.16	10 40 09.6	9.2	9.276	52.50	0 32.19	15 56.50	1 05.05	1 43 30.43
19	1 46 41.05	40.93	11 01 04.5	3.8	9.293	52.05	0 45.92	15 56.24	1 05.11	1 47 26.98
20	1 50 24.27	24.11	11 21 48.3	47.4	9.310	51.59	0 59.25	15 55.98	1 05.17	1 51 23.53
21	1 54 07.89	7.69	+ 11 42 21.0	19.9	9.327	+ 51.12	− 1 12.19	15 55.72	1 05.23	1 55 20.09
22	1 57 51.93	51.70	12 02 42.2	40.9	9.345	50.63	1 24.70	15 55.46	1 05.30	1 59 16.64
23	2 01 36.42	36.17	12 22 51.5	50.1	9.363	50.13	1 36.75	15 55.20	1 05.36	2 03 13.19
24	2 05 21.37	21.10	12 42 48.6	47.2	9.382	49.62	1 48.36	15 54.95	1 05.43	2 07 09.75
25	2 09 06.79	6.49	13 02 33.2	31.6	9.402	49.09	1 59 48	15 54.70	1 05.50	2 11 06.30
26	2 12 52.70	52.37	+ 13 22 05.0	3.3	9.423	+ 48.55	− 2 10.13	15 54.45	1 05.57	2 15 02.85
27	2 16 39.12	38.76	13 41 23.8	22.0	9.444	48.00	2 20.27	15 54.20	1 05.64	2 18 59.41
28	2 20 26.04	25.65	14 00 29.0	27.1	9.466	47.44	2 29.90	15 53.96	1 05.72	2 22 55.96
29	2 24 13.49	13.07	14 19 20.6	18.6	9.488	46.85	2 39.01	15 53.71	1 05.80	2 26 52.52
30	2 28 01.48	1.04	14 37 58.0	55.9	9.511	46.26	2 47.57	15 53.47	1 05.87	2 30 49.07
May 1	2 31 50.01	49.54	+ 14 56 21.1	18.9	9.534	+ 45.65	− 2 55.59	15 53.23	1 05.94	2 34 45.62
2	2 35 39.10	38.61	15 14 29.4	27.1	9.557	45.03	3 03.06	15 52.99	1 06.02	2 38 42.18
3	2 39 28.74	28.24	15 32 22.7	20.3	9.580	44.40	3 09.98	15 52.76	1 06.11	2 42 38.73
4	2 43 18.95	18.43	15 49 60.7	58.3	9.604	43.76	3 16.33	15 52.53	1 06.19	2 46 35.29
5	2 47 09.74	9.19	16 07 23.0	20.6	9.628	43.10	3 22.10	15 52.30	1 06.27	2 50 31.84
6	2 51 01.09	0.52	+ 16 24 29.2	26.8	9.652	+ 42.42	− 3 27.30	15 52.08	1 06.35	2 54 28.39
7	2 54 53.01	52.43	16 41 19.2	16.7	9.675	41.73	3 31.94	15 51.85	1 06.43	2 58 24.95
8	2 58 45.50	44.91	16 57 52.6	50.1	9.699	41.03	3 36.00	15 51.63	1 06.51	3 02 21.50
9	3 02 38.55	37.95	17 14 09.0	6.5	9.722	40.33	3 39.50	15 51.41	1 06.59	3 06 18.06
10	3 06 32.17	31.56	17 30 08.1	5.6	9.746	39.60	3 42.43	15 51.19	1 06.67	3 10 14.61
11	3 10 26.34	25.73	+ 17 45 49.7	47.3	9.769	+ 38.86	− 3 44.82	15 50.98	1 06.76	3 14 11.17
12	3 14 21.08	20.46	18 01 13.3	10.9	9.792	38.11	3 46.64	15 50.77	1 06.84	3 18 07.72
13	3 18 16.36	15.75	18 16 18.8	16.5	9.815	37.34	3 47.92	15 50.56	1 06.92	3 22 04.28
14	3 22 12.21	11.59	18 31 05.8	3.5	9.838	36.56	3 48.62	15 50.36	1 07.00	3 26 00.83
15	3 26 08.61	7.99	18 45 34.2	32.0	9.861	35.78	3 48.78	15 50.16	1 07.08	3 29 57.39
16	3 30 05.55	4.93	+ 18 59 43.5	41.3	9.884	+ 34.99	− 3 48.39	15 49.96	1 07.16	3 33 53.94
17	3 34 03.04	2.42	+ 19 13 33.4	31.3	9.907	+ 34.17	− 3 47.45	15 49.77	1 07.25	3 37 50.50

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.15ˢ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
May 17	3 34 03.04	2.42	+19 13 33.4	31.3	9.907	+34.17	− 3 47.45	15 49.77	1 07.25	3 37 50.50
18	3 38 01.09	0.46	19 27 03.9	1.8	9.930	33.35	3 45.95	15 49.58	1 07.33	3 41 47.05
19	3 41 59.67	59.05	19 40 14.6	12.6	9.953	32.53	3 43.94	15 49.39	1 07.41	3 45 43.61
20	3 45 58.81	58.19	19 53 05.3	3.3	9.976	31.69	3 41.35	15 49.21	1 07.49	3 49 40.16
21	3 49 58.49	57.88	20 05 35.6	33.7	9.998	30.84	3 38.24	15 49.03	1 07.57	3 53 36.72
22	3 53 58.71	58.11	+20 17 45.3	43.5	10.020	+29.97	− 3 34.58	15 48.85	1 07.64	3 57 33.28
23	3 57 59.45	58.86	20 29 34.3	32.6	10.042	29.10	3 30.39	15 48.67	1 07.72	4 01 29.83
24	4 02 00.72	0.15	20 41 02.1	0.5	10.064	28.21	3 25.68	15 48.50	1 07.79	4 05 26.39
25	4 06 02.51	1.95	20 52 08.7	7.2	10.085	27.32	3 20.44	15 48.34	1 07.86	4 09 22.94
26	4 10 04.82	4.27	21 02 53.9	52.5	10.106	26.42	3 14.69	15 48.18	1 07.93	4 13 19.50
27	4 14 07.63	7.09	+21 13 17.4	16.1	10.127	+25.51	− 3 08.44	15 48.02	1 08.00	4 17 16.06
28	4 18 10.94	10.42	21 23 18.9	17.6	10.148	24.59	3 01.68	15 47.87	1 08.06	4 21 12.61
29	4 22 14.73	14.23	21 32 58.2	57.0	10.168	23.67	2 54.46	15 47.71	1 08.12	4 25 09.17
30	4 26 19.00	18.52	21 42 15.2	14.1	10.187	22.74	2 46.74	15 47.56	1 08.18	4 29 05.72
31	4 30 23.73	23.28	21 51 09.7	8.7	10.206	21.80	2 38.57	15 47.41	1 08.24	4 33 02.28
June 1	4 34 28.90	28.49	+21 59 41.4	40.5	10.224	+20.84	− 2 29.96	15 47.27	1 08.30	4 36 58.84
2	4 38 34.50	34.11	22 07 50.2	49.4	10.242	19.88	2 20.91	15 47.13	1 08.36	4 40 55.39
3	4 42 40.51	40.13	22 15 35.7	35.0	10.258	18.91	2 11.46	15 47.00	1 08.41	4 44 51.95
4	4 46 46.91	46.55	22 22 58.2	57.6	10.274	17.94	2 01.62	15 46.87	1 08.47	4 48 48.51
5	4 50 53.68	53.36	22 29 57.1	56.6	10.289	16.96	1 51.39	15 46.75	1 08.52	4 52 45.06
6	4 55 00.78	0.49	+22 36 32.4	32.0	10.303	+15.98	− 1 40.85	15 46.63	1 08.57	4 56 41.62
7	4 59 08.21	7.95	22 42 44.0	43.6	10.316	14.99	1 29.98	15 46.52	1 08.61	5 00 38.18
8	5 03 15.93	15.70	22 48 31.7	31.4	10.327	13.99	1 18.82	15 46.41	1 08.65	5 04 34.73
9	5 07 23.93	23.72	22 53 55.4	55.1	10.338	12.98	1 07.37	15 46.30	1 08.69	5 08 31.29
10	5 11 32.16	31.98	22 58 55.1	54.9	10.348	11.97	0 55.70	15 46.20	1 08.73	5 12 27.85
11	5 15 40.61	40.48	+23 03 30.4	30.2	10.357	+10.96	− 0 43.80	15 46.10	1 08.76	5 16 24.40
12	5 19 49.26	49.17	23 07 41.4	41.3	10.364	9.95	0 31.71	15 46.00	1 08.78	5 20 20.96
13	5 23 58.09	58.04	23 11 27.9	27.8	10.371	8.93	0 19.43	15 45.91	1 08.80	5 24 17.52
14	5 28 07.07	7.05	23 14 50.1	50.1	10.377	7.91	− 0 07.00	15 45.82	1 08.82	5 28 14.07
15	5 32 16.18	16.19	23 17 47.6	47.6	10.382	6.88	+ 0 05.54	15 45.74	1 08.84	5 32 10.63
16	5 36 25.41	25.46	+23 20 20.5	20.5	10.386	+ 5.86	+ 0 18.21	15 45.66	1 08.86	5 36 07.19
17	5 40 34.73	34.82	23 22 28.7	28.7	10.390	4.83	0 30.98	15 45.59	1 08.87	5 40 03.74
18	5 44 44.11	44.24	23 24 12.1	12.1	10.392	3.80	0 43.82	15 45.52	1 08.88	5 44 00.30
19	5 48 53.56	53.73	23 25 30.7	30.7	10.394	2.76	0 56.71	15 45.45	1 08.89	5 47 56.86
20	5 53 03.03	3.23	23 26 24.6	24.6	10.395	1.73	1 09.63	15 45.39	1 08.90	5 51 53.41
21	5 57 12.52	12.76	+23 26 53.7	53.7	10.395	+ 0.70	+ 1 22.56	15 45.33	1 08.90	5 55 49.97
22	6 01 22.00	22.27	23 26 58.0	58.0	10.394	− 0.34	1 35.48	15 45.27	1 08.90	5 59 46.53
23	6 05 31.43	31.74	23 26 37.5	37.5	10.392	1.37	1 48.37	15 45.22	1 08.89	6 03 43.08
24	6 09 40.83	41.17	23 25 52.2	52.1	10.390	2.40	2 01.21	15 45.17	1 08.88	6 07 39.64
25	6 13 50.15	50.54	23 24 42.1	42.0	10.387	3.43	2 13.97	15 45.13	1 08.87	6 11 36.20
26	6 17 59.38	59.81	+23 23 07.3	7.1	10.382	− 4.46	+ 2 26.64	15 45.10	1 08.85	6 15 32.76
27	6 22 08.51	8.96	23 21 07.8	7.6	10.377	5.49	2 39.22	15 45.07	1 08.83	6 19 29.31
28	6 26 17.50	17.99	23 18 43.6	43.3	10.372	6.52	2 51.65	15 45.05	1 08.80	6 23 25.87
29	6 30 26.34	26.86	23 15 54.8	54.4	10.365	7.54	3 03.93	15 45.03	1 08.77	6 27 22.43
30	6 34 35.00	35.56	23 12 41.6	41.1	10.356	8.56	3 16.04	15 45.01	1 08.74	6 31 18.98
31	6 38 43.45	44.05	+23 09 04.0	3.5	10.347	− 9.58	+ 3 27.95	15 45.00	1 08.71	6 35 15.54
32	6 42 51.70	52.33	+23 05 01.9	1.3	10.338	− 10.59	+ 3 39.63	15 44.99	1 08.68	6 39 12.10

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19ˢ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
July 1	6 38 43.45	44.05	+23 09 04.0	3.5	10.347	− 9.58	+ 3 27.95	15 45.00	1 08.71	6 35 15.54
2	6 42 51.70	52.33	23 05 01.9	1.3	10.338	10.59	3 39.63	15 44.99	1 08.68	6 39 12.10
3	6 46 59.69	60.35	23 00 35.7	35.0	10.327	11.59	3 51.06	15 44.99	1 08.64	6 43 08.65
4	6 51 07.40	8.09	22 55 45.4	44.6	10.315	12.59	4 02.21	15 44.99	1 08.60	6 47 05.21
5	6 55 14.81	15.53	22 50 31.2	30.3	10.302	13.59	4 13.07	15 44.99	1 08.56	6 51 01.77
6	6 59 21.89	22.65	+22 44 53.0	52.0	10.288	− 14.58	+ 4 23.60	15 45.00	1 08.52	6 54 58.32
7	7 03 28.62	29.40	22 38 51.2	50.0	10.273	15.57	4 33.77	15 45.01	1 08.47	6 58 54.88
8	7 07 34.98	35.79	22 32 25.9	24.6	10.256	16.54	4 43.57	15 45.02	1 08.42	7 02 51.44
9	7 11 40.94	41.79	22 25 37.2	35.8	10.239	17.51	4 52.99	15 45.04	1 08.36	7 06 47.99
10	7 15 46.49	47.35	22 18 25.2	23.7	10.222	18.48	5 01.98	15 45.07	1 08.30	7 10 44.55
11	7 19 51.60	52.47	+22 10 50.3	48.6	10.203	−19.43	+ 5 10.52	15 45.10	1 08.24	7 14 41.11
12	7 23 56.25	57.15	22 02 52.6	50.8	10.184	20.38	5 18.62	15 45.14	1 08.18	7 18 37.66
13	7 28 00.43	1.35	21 54 32.2	30.3	10.164	21.32	5 26.24	15 45.18	1 08.11	7 22 34.22
14	7 32 04.13	5.07	21 45 49.3	47.3	10.144	22.25	5 33.38	15 45.22	1 08.05	7 26 30.78
15	7 36 07.34	8.29	21 36 44.0	41.8	10.123	23.18	5 40.04	15 45.27	1 07.98	7 30 27.33
16	7 40 10.03	11.00	+21 27 16.7	14.4	10.101	− 24.09	+ 5 46.16	15 45.32	1 07.91	7 34 23.89
17	7 44 12.21	13.19	21 17 27.5	25.1	10.079	25.00	5 51.79	15 45.38	1 07.84	7 38 20.44.
18	7 48 13.86	14.85	21 07 16.7	14.2	10.057	25.90	5 56.88	15 45.44	1 07.76	7 42 17.00
19	7 52 14.97	15.97	20 56 44.5	41.8	10.035	26.79	6 01.43	15 45.51	1 07.69	7 46 13.56
20	7 56 15.54	16.55	20 45 51.0	48.2	10.012	27.67	6 05.45	15 45.59	1 07.61	7 50 10.11
21	8 00 15.56	16.58	+20 34 36.5	33.6	9.989	− 28.53	+ 6 08.90	15 45.67	1 07.53	7 54 06.67
22	8 04 15.02	16.04	20 22 61.1	58.1	9.966	29.39	6 11.81	15 45.75	1 07.45	7 58 03.22
23	8 08 13.92	14.95	20 11 05.2	2.1	9.943	30.25	6 14.16	15 45.83	1 07.37	8 01 59.78
24	8 12 12.25	13.28	19 58 49.1	45.9	9.919	31.09	6 15.93	15 45.92	1 07.28	8 05 56.34
25	8 16 10.03	11.07	19 46 13.0	9.7	9.896	31.92	6 17.14	15 46.01	1 07.20	8 09 52.89
26	8 20 07.23	08.27	+19 33 17.0	13.6	9.872	− 32.74	+ 6 17.78	15 46.10	1 07.12	8 13 49.45
27	8 24 03.87	04.91	19 19 61.4	57.9	9.848	33.55	6 17.86	15 46.20	1 07.03	8 17 46.00
28	8 27 59.91	60.94	19 06 26.6	23.0	9.824	34.35	6 17.35	15 46.30	1 06.95	8 21 42.56
29	8 31 55.38	56.41	18 52 32.7	29.0	9.800	35.14	6 16.27	15 46.41	1 06.86	8 25 39.11
30	8 35 50.28	51.30	18 38 20.1	16.3	9.775	35.91	6 14.61	15 46 52	1 06.78	8 29 35.67
31	8 39 44.58	45.59	+18 23 49.1	45.3	9.751	− 36.67	+ 6 12.36	15 46.64	1 06.69	8 33 32.22
Aug. 1	8 43 38.30	39.30	18 08 60.0	56.2	9.726	37.42	6 09.51	15 46.76	1 06.61	8 37 28.78
2	8 47 31.42	32.41	17 53 53.0	49.1	9.701	38.16	6 06.08	15 46.88	1 06.52	8 41 25.33
3	8 51 23.94	24.91	17 38 28.4	24.5	9.676	38.88	6 02.04	15 47.01	1 06.43	8 45 21.89
4	8 55 15.86	16.82	17 22 46.8	42.9	9.651	39.59	5 57.41	15 47.14	1 06.34	8 49 18.44
5	8 59 07.18	8.12	+17 06 48.2	44.3	9.626	− 40.29	+ 5 52.16	15 47.28	1 06.25	8 53 15.00
6	9 02 57.88	58.81	16 50 32.9	29.0	9.600	40.97	5 46.31	15 47.42	1 06.17	8 57 11.55
7	9 06 47.98	48.89	16 33 61.4	57.5	9.575	41.64	5 39.85	15 47.56	1 06.08	9 01 08.10
8	9 10 37.47	38.36	16 17 13.9	10.1	9.550	42.30	5 32.78	15 47.71	1 05.99	9 05 04.66
9	9 14 26.37	27.23	16 00 10.8	7.0	9.525	42.94	5 25.13	15 47.86	1 05.90	9 09 01.21
10	9 18 14.66	15.51	+15 42 52.4	48.6	9.500	− 43.57	+ 5 16.86	15 48.02	1 05.82	9 12 57.77
11	9 22 02.36	3.17	15 25 18.8	15.0	9.475	44.20	5 08.01	15 48.18	1 05.74	9 16 54.32
12	9 25 49.47	50.25	15 07 30.5	26.7	9.451	44.81	4 58.56	15 48.35	1 05.66	9 20 50.88
13	9 29 36.01	36.76	14 49 27.7	24.0	9.427	45.41	4 48.55	15 48.52	1 05.58	9 24 47.43
14	9 33 21.98	22.70	14 31 10.8	7.2	9.404	45.99	4 37.97	15 48.69	1 05.50	9 28 43.98
15	9 37 07.39	8.09	+14 12 40.0	36.5	9.381	− 46.56	+ 4 26.82	15 48.86	1 05.42	9 32 40.54
16	9 40 52.25	52.92	+13 53 55.6	52.2	9.358	− 47.12	+ 4 15.12	15 49.04	1 05.34	9 36 37.09

NOTE.—For mean time interval of semidiameter passing meridian subtract 0 19ˢ from the sidereal interval

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App Noon	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Aug. 16	9 40 52.25	52.92	+13 53 55.6	52.2	9.358	−47.12	+ 4 15.12	15 49.04	1 05.34	9 36 37.09
17	9 44 36.58	37.22	13 34 58.1	54.9	9.336	47.67	4 02.90	15 49.22	1 05.27	9 40 33.64
18	9 48 20.39	20.99	13 15 47.7	44.6	9.315	48.20	3 50.16	15 49.40	1 05.20	9 44 30.20
19	9 52 03.68	4.24	12 56 24.6	21.6	9.294	48.72	3 36.90	15 49.58	1 05.13	9 48 26.75
20	9 55 46.50	47.01	12 36 49.1	46.3	9.274	49.22	3 23.16	15 49.77	1 05.06	9 52 23.31
21	9 59 28.83	29.30	+12 16 61.7	59.1	9.255	−49.71	+ 3 08.94	15 49.96	1 04.99	9 56 19.86
22	10 03 10.71	11.15	11 56 62.4	59.9	9.236	50.20	2 54.27	15 50.16	1 04.92	10 00 16.41
23	10 06 52.14	52.55	11 36 51.7	49.4	9.217	50.68	2 39.15	15 50.36	1 04.85	10 04 12.97
24	10 10 33.14	33.51	11 16 29.9	27.8	9.200	51.13	2 23.60	15 50.57	1 04.79	10 08 09.52
25	10 14 13.74	14.06	10 55 57.3	55.4	9.184	51.57	2 07.65	15 50.78	1 04.72	10 12 06.07
26	10 17 53.94	54.22	+10 35 14.2	12.5	9.168	−52.01	+ 1 51.30	15 50.99	1 04.66	10 16 02.62
27	10 21 33.76	34.00	10 14 20.8	19.3	9.152	52.43	1 34.56	15 51.21	1 04.60	10 19 59.18
28	10 25 13.21	13.42	9 53 17.6	16.4	9.137	52.83	1 17.47	15 51.43	1 04.55	10 23 55.73
29	10 28 52.32	52.49	9 32 04.9	3.9	9.122	53.22	1 00.04	15 51.65	1 04.49	10 27 52.28
30	10 32 31.08	31.20	9 10 43.0	42.3	9.108	53.60	0 42.24	15 51.87	1 04.44	10 31 48.84
31	10 36 09.52	9.59	+ 8 49 12.3	11.9	9.095	−53.95	+ 0 24.13	15 52.09	1 04.39	10 35 45.39
Sept. 1	10 39 47.65	47.66	8 27 33.2	33.1	9.082	54.30	+ 0 05.71	15 52.31	1 04.34	10 39 41.94
2	10 43 25.46	25.42	8 05 45.8	46.0	9.069	54.64	− 0 13.01	15 52.54	1 04.29	10 43 38.49
3	10 47 02.99	2.91	7 43 50.6	51.1	9.058	54.96	0 32.04	15 52.77	1 04.25	10 47 35.05
4	10 50 40.24	40.11	7 21 48.0	48.7	9.047	55.26	0 51.34	15 53.01	1 04.21	10 51 31.60
5	10 54 17.24	17.06	+ 6 59 38.2	39.3	9.036	−55.55	− 1 10.89	15 53.23	1 04.18	10 55 28.15
6	10 57 53.98	53.75	6 37 21.7	23.1	9.026	55.83	1 30.70	15 53.47	1 04.14	10 59 24.70
7	11 01 30.49	30.21	6 14 58.6	60.3	9.017	56.08	1 50.74	15 53.71	1 04.11	11 03 21.26
8	11 05 06.78	6.45	5 52 29.6	31.8	9.008	56.33	2 10.99	15 53.95	1 04.09	11 07 17.81
9	11 08 42.87	42.50	5 29 54.7	57.0	9.001	56.57	2 31.44	15 54.19	1 04.07	11 11 14.36
10	11 12 18.80	18.36	+ 5 07 14.2	16.9	8.994	−56.78	− 2 52.07	15 54.44	1 04.05	11 15 10.91
11	11 15 54.56	54.07	4 44 28.6	31.7	8.988	56.99	3 12.85	15 54.69	1 04.03	11 19 07.46
12	11 19 30.18	29.64	4 21 38.2	41.6	8.982	57.19	3 33.79	15 54.94	1 04.01	11 23 04.02
13	11 23 05.67	5.09	3 58 43.3	47.0	8.977	57.38	3 54.83	15 55.20	1 04.00	11 27 00.57
14	11 26 41.07	40.44	3 35 44.2	48.2	8.973	57.54	4 15.98	15 55.46	1 03.99	11 30 57.12
15	11 30 16.40	15.71	+ 3 12 41.3	45.7	8.971	−57.70	− 4 37.20	15 55.72	1 03.98	11 34 53.67
16	11 33 51.67	50.93	2 49 34.8	39.5	8.969	57.84	4 58.48	15 55.98	1 03.97	11 38 50.22
17	11 37 26.90	26.10	2 26 25.1	30.2	8.968	57.97	5 19.79	15 56.24	1 03.97	11 42 46.78
18	11 41 02.13	1.28	2 03 12.4	17.9	8.968	58.08	5 41.11	15 56.50	1 03.97	11 46 43.33
19	11 44 37.38	36.47	1 39 57.2	63.0	8.969	58.18	6 02.40	15 56.76	1 03.97	11 50 39.88
20	11 48 12.67	11.71	+ 1 16 39.6	45.8	8.972	−58.27	− 6 23.66	15 57.03	1 03.97	11 54 36.42
21	11 51 48.03	47.02	0 53 20.1	26.6	8.975	58.34	6 44.85	15 57.29	1 03.98	11 58 32.98
22	11 55 23.48	22.41	0 29 58.9	65.8	8.979	58.41	7 05.96	15 57.56	1 03.99	12 02 29.54
23	11 58 59.04	57.92	+ 0 06 36.4	43.7	8.984	58.46	7 26.94	15 57.83	1 04.01	12 06 26.09
24	12 02 34.74	33.57	− 0 16 47.1	39.5	8.990	58.50	7 47.79	15 58.10	1 04.03	12 10 22.64
25	12 06 10.58	9.36	− 0 40 11.2	3.3	8.998	−58.51	− 8 08.48	15 58.37	1 04.05	12 14 19.19
26	12 09 46.61	45.33	1 03 35.6	27.4	9.006	58.52	8 29.01	15 58.64	1 04.07	12 18 15.74
27	12 13 22.83	21.50	1 26 60.0	51.4	9.014	58.51	8 49.36	15 58.91	1 04.10	12 22 12.30
28	12 16 59.26	57.88	1 50 23.8	14.9	9.023	58.48	9 09.46	15 59.18	1 04.14	12 26 08.85
29	12 20 35.92	34.49	2 13 46.9	37.7	9.033	58.44	9 29.35	15 59.46	1 04.18	12 30 05.40
30	12 24 12.83	11.35	− 2 36 69.0	59.4	9.043	−58.39	− 9 48.99	15 59.73	1 04.21	12 34 01.95
31	12 27 50.01	48.48	− 3 00 29.5	19.6	9.055	−58.31	−10 08.34	16 00.01	1 04.25	12 37 58.50

NOTE.—For mean time interval of semidiameter passing meridian subtract 0.18ˢ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

$+ A 3 \overset{S}{8}$

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semidiameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Oct. 1	12 27 50.01	48.48	− 3 00 29.5	19.6	9.055	− 58.31	− 10 08.34	16 00.01	1 04.25	12 37 58.50
2	12 31 27.46	25.88	3 23 47.9	37.7	9.067	58.22	10 27.44	16 00.29	1 04.29	12 41 55.05
3	12 35 05.22	3.59	3 46 64.1	53.8	9.080	58.12	10 46.25	16 00.57	1 04.34	12 45 51.61
4	12 38 43.28	41.60	4 10 17.7	7.1	9.093	58.00	11 04.74	16 00.84	1 04.39	12 49 48.16
5	12 42 21.67	19.94	4 33 28.3	17.3	9.107	57.87	11 22.89	16 01.12	1 04.44	12 53 44.71
6	12 45 60.42	58.64	− 4 56 35.4	24.1	9.122	− 57.72	− 11 40.70	16 01.39	1 04.49	12 57 41.26
7	12 49 39.53	37.70	5 19 38.9	27.4	9.138	57.55	11 58.14	16 01.67	1 04.55	13 01 37.81
8	12 53 19.02	17.14	5 42 38.2	26.4	9.154	57.37	12 15.21	16 01.94	1 04.61	13 05 34.37
9	12 56 58.91	56.98	6 05 33.0	21.0	9.171	57.18	12 31.87	16 02.22	1 04.68	13 09 30.92
10	13 00 39.23	37.25	6 28 22.9	10.7	9.189	56.97	12 48.10	16 02.49	1 04.74	13 13 27.47
11	13 04 20.00	17.98	− 6 50 67.7	55.3	9.208	− 56.75	− 13 03.88	16 02.77	1 04.81	13 17 24.02
12	13 07 61.22	59.16	7 13 46.7	34.1	9.228	56.50	13 19.22	16 03.04	1 04.88	13 21 20.58
13	13 11 42.91	40.81	7 36 19.8	7.0	9.248	56.24	13 34.08	16 03.32	1 04.96	13 25 17.13
14	13 15 25.11	22.96	7 58 46.6	33.6	9.270	55.97	13 48.42	16 03.60	1 05.04	13 29 13.68
15	13 19 07.83	5.64	8 20 66.8	53.7	9.292	55.69	14 02.26	16 03.88	1 05.12	13 33 10.23
16	13 22 51.11	48.88	− 8 43 19.7	6.6	9.315	− 55.38	− 14 15.55	16 04.16	1 05.20	13 37 06.79
17	13 26 34.95	32.68	9 05 25.3	12.1	9.339	55.07	14 28.26	16 04.43	1 05.28	13 41 03.34
18	13 30 19.38	17.07	9 27 23.1	9.8	9.364	54.74	14 40.39	16 04.70	1 05.36	13 44 59.89
19	13 34 04.41	2.06	9 48 72.8	59.4	9.390	54.39	14 51.91	16 04.97	1 05.45	13 48 56.44
20	13 37 50.08	47.69	10 10 53.9	40.4	9.417	54.03	15 02.81	16 05.24	1 05.54	13 52 53.00
21	13 41 36.39	33.97	− 10 32 26.1	12.5	9.444	− 53.65	− 15 13.05	16 05.51	1 05.63	13 56 49.55
22	13 45 23.38	20.93	10 53 49.0	35.3	9.472	53.25	15 22.62	16 05.78	1 05.73	14 00 46.10
23	13 49 11.06	8.58	11 14 62.3	48.6	9.501	52.84	15 31.51	16 06.04	1 05.83	14 04 42.66
24	13 52 59.44	56.94	11 35 65.5	51.8	9.531	52.41	15 39.68	16 06.30	1 05.94	14 08 39.21
25	13 56 48.54	46.02	11 56 58.1	44.4	9.561	51.96	15 47.15	16 06.56	1 06.04	14 12 35.76
26	14 00 38.37	35.82	− 12 17 39.8	26.1	9.591	− 51.50	− 15 53.88	16 06.82	1 06.14	14 16 32.32
27	14 04 28.94	26.37	12 37 70.4	56.8	9.623	51.03	15 59.87	16 07.08	1 06.25	14 20 28.87
28	14 08 20.26	17.67	12 58 29.2	15.6	9.655	50.53	16 05.10	16 07.34	1 06.35	14 24 25.42
29	14 12 12.36	9.75	13 18 35.9	22.4	9.687	50.02	16 09.57	16 07.60	1 06.46	14 28 21.98
30	14 16 05.21	2.58	13 38 30.0	16.6	9.719	49.48	16 13.27	16 07.86	1 06.57	14 32 18.53
31	14 19 58.84	56.20	− 13 57 71.2	57.9	9.751	− 48.94	− 16 16.20	16 08.11	1 06.68	14 36 15.08
Nov. 1	14 23 53.26	50.59	14 17 39.0	25.8	9.784	48.37	16 18.36	16 08.36	1 06.79	14 40 11.64
2	14 27 48.47	45.78	14 36 52.8	39.7	9.817	47.78	16 19.71	16 08.61	1 06.90	14 44 08.19
3	14 31 44.47	41.78	14 55 52.6	39.7	9.850	47.18	16 20.27	16 08.86	1 07.02	14 48 04.74
4	14 35 41.27	38.58	15 14 37.8	25.2	9.883	46.57	16 20.03	16 09.10	1 07.14	14 52 01.30
5	14 39 38.88	36.18	− 15 32 67.9	55.5	9.917	− 45.93	− 16 18.97	16 09.35	1 07.26	14 55 57.85
6	14 43 37.30	34.60	15 51 22.6	10.3	9.951	45.28	16 17.11	16 09.59	1 07.38	14 59 54.41
7	14 47 36.54	33.84	16 09 21.4	9.3	9.985	44.60	16 14.44	16 09.83	1 07.50	15 03 50.96
8	14 51 36.60	33.90	16 26 63.8	52.0	10.019	43.92	16 10.95	16 10.06	1 07.62	15 07 47.52
9	14 55 37.48	34.78	16 44 29.6	18.0	10.053	43.22	16 06.63	16 10.29	1 07.74	15 11 44.07
10	14 59 39.18	36.49	− 17 01 38.3	26.9	10.088	− 42.49	− 16 01.49	16 10.52	1 07.86	15 15 40.62
11	15 03 41.71	39.02	17 18 29.6	18.4	10.122	41.76	15 55.54	16 10.74	1 07.98	15 19 37.18
12	15 07 45.08	42.40	17 34 62.9	52.0	10.157	41.01	15 48.74	16 10.96	1 08.10	15 23 33.74
13	15 11 49.28	46.61	17 51 18.1	7.5	10.192	40.24	15 41.10	16 11.19	1 08.22	15 27 30.29
14	15 15 54.33	51.67	18 07 14.5	4.3	10.227	39.46	15 32.61	16 11.41	1 08.34	15 31 26.84
15	15 19 60.21	57.57	− 18 22 51.9	42.0	10.262	− 38.65	− 15 23.29	16 11.62	1 08.46	15 35 23.40
16	15 24 06.94	4.32	− 18 38 09.9	0.3	10.297	− 37.83	− 15 13.12	16 11.83	1 08.58	15 39 19.95

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18s from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Nov. 16	15 24 06.94	4.32	-- 18 38 09.9	0.3	10.297	− 37.83	− 15 13.12	16 11.83	1 08.58	15 39 19.95
17	15 28 14.51	11.92	18 52 68.1	58.9	10.333	37.00	15 02.12	16 12.04	1 08.70	15 43 16.51
18	15 32 22.93	20.36	19 07 46.2	37.3	10.368	36.16	14 50.27	16 12.24	1 08.81	15 47 13.07
19	15 36 32.20	29.66	19 21 63.8	55.2	10.403	35.29	14 37.55	16 12.44	1 08.92	15 51 09.62
20	15 40 42.32	39.80	19 35 60.5	52.2	10.438	34.42	14 24.01	16 12.64	1 09.03	15 55 06.18
21	15 44 53.27	50.79	− 19 49 35.9	27.9	10.473	− 33.53	− 14 09.62	16 12.84	1 09.14	15 59 02.73
22	15 49 05.04	2.61	20 02 49.7	42.0	10.507	32.61	13 54.41	16 13.03	1 09.25	16 02 59.29
23	15 53 17.63	15.24	20 15 41.3	34.1	10.541	31.69	13 38.37	16 13.22	1 09.36	16 06 55.85
24	15 57 31.03	28.68	20 28 10.7	3.9	10.575	30.75	13 21.53	16 13.40	1 09.46	16 10 52.40
25	16 01 45.22	42.91	20 40 17.4	10.9	10.608	29.79	13 03.90	16 13.58	1 09.57	16 14 48.96
26	16 05 60.20	57.92	− 20 51 61.1	54.9	10.640	− 28.83	− 12 45.49	16 13.76	1 09.68	16 18 45.51
27	16 10 15.92	13.69	21 03 21.4	15.6	10.671	27.85	12 26.33	16 13.94	1 09.78	16 22 42.07
28	16 14 32.37	30.20	21 14 17.9	12.5	10.701	26.86	12 06.43	16 14.10	1 09.88	16 26 38.63
29	16 18 49.55	47.45	21 24 50.4	45.3	10.730	25.85	11 45.80	16 14.26	1 09.98	16 30 35.18
30	16 23 07.42	5.38	21 34 58.5	53.7	10.759	24.83	11 24.49	16 14.42	1 10.07	16 34 31.74
Dec. 1	16 27 25.96	23.98	− 21 44 42.0	37.6	10.786	− 23.80	− 11 02.51	16 14.58	1 10.16	16 38 28.30
2	16 31 45.16	43.24	21 53 60.4	56.4	10.812	22.74	10 39.86	16 14.73	1 10.25	16 42 24.85
3	16 36 04.97	3.11	22 02 53.7	50.0	10.837	21.68	10 16.61	16 14.88	1 10.33	16 46 21.41
4	16 40 25.37	23.59	22 11 21.5	18.2	10.862	20.62	9 52.77	16 15.02	1 10.41	16 50 17.97
5	16 44 46.35	44.64	22 19 23.3	20.3	10.885	19.54	9 28.33	16 15.16	1 10.49	16 54 14.52
6	16 49 07.88	6.24	− 22 26 59.2	56.5	10.907	− 18.44	− 9 03.36	16 15.29	1 10.56	16 58 11.08
7	16 53 29.92	28.36	22 34 08.9	6.4	10.928	17.34	8 37.87	16 15.42	1 10.63	17 02 07.64
8	16 57 52.45	50.96	22 40 52.1	49.9	10.948	16.24	8 11.88	16 15.54	1 10.70	17 06 04.19
9	17 02 15.45	14.03	22 47 08.5	6.5	10.967	15.12	7 45.44	16 15.66	1 10.77	17 10 00.75
10	17 06 38.87	37.53	22 52 58.1	56.4	10.984	14.00	7 18.57	16 15.77	1 10.83	17 13 57.31
11	17 11 02.71	1.45	− 22 58 20.5	19.0	11.000	− 12.86	− 6 51.28	16 15.88	1 10.89	17 17 53.86
12	17 15 26.92	25.75	23 03 15.7	14.4	11.016	11.72	6 23.62	16 15.99	1 10.94	17 21 50.42
13	17 19 51.48	50.40	23 07 43.4	42.3	11.030	10.57	5 55.62	16 16.10	1 10.99	17 25 46.98
14	17 24 16.36	15.36	23 11 43.5	42.7	11.043	9.42	5 27.29	16 16.20	1 11.03	17 29 43.54
15	17 28 41.54	40.62	23 15 16.0	15.4	11.055	8.27	4 58.65	16 16.30	1 11.07	17 33 40.09
16	17 33 07.00	6.17	− 23 18 20.6	20.1	11.066	− 7.11	− 4 29.74	16 16.39	1 11.10	17 37 36.65
17	17 37 32.71	31.96	23 20 57.1	56.7	11.076	5.94	4 00.59	16 16.47	1 11.12	17 41 33.21
18	17 41 58.62	57.97	23 23 05.5	5.2	11.084	4.77	3 31.21	16 16.54	1 11.14	17 45 29.76
19	17 46 24.72	24.16	23 24 46.0	45.8	11.090	3.60	3 01.66	16 16.61	1 11.16	17 49 26.32
20	17 50 50.99	50.52	23 25 58.2	58.1	11.096	2.42	2 31.94	16 16.68	1 11.18	17 53 22.88
21	17 55 17.37	16.99	− 23 26 42.2	42.1	11.101	− 1.25	− 2 02.11	16 16.74	1 11.19	17 57 19.44
22	17 59 43.85	43.56	23 26 58.0	58.0	11.104	− 0.07	1 32.17	16 16.80	1 11.20	18 01 15.99
23	18 04 10.38	10.19	23 26 45.5	45.5	11.106	+ 1.11	1 02.19	16 16.86	1 11.21	18 05 12.55
24	18 08 36.92	36.83	23 26 04.6	4.6	11.106	2.29	0 32.20	16 16.91	1 11.21	18 09 09.11
25	18 13 03.45	3.45	23 24 55.5	55.5	11.104	3.47	− 0 02.21	16 16.95	1 11.20	18 13 05.66
26	18 17 29.91	30.00	− 23 23 18.1	18.1	11.101	+ 4.64	+ 0 27.70	16 16.98	1 11.19	18 17 02.22
27	18 21 56.29	56.47	23 21 12.6	12.5	11.097	5.82	0 57.53	16 17.01	1 11.17	18 20 58.78
28	18 26 22.54	22.81	23 18 38.8	38.6	11.091	6.99	1 27.23	16 17.03	1 11.14	18 24 55.34
29	18 30 48.62	48.98	23 15 37.0	36.7	11.082	8.16	1 56.76	16 17.05	1 11.11	18 28 51.90
30	18 35 14.49	14.94	23 12 07.3	6.9	11.073	9.32	2 26.09	16 17.07	1 11.08	18 32 48.45
31	18 39 40.12	40.66	− 23 08 09.6	9.1	11.062	+ 10.48	+ 2 55.17	16 17.09	1 11.05	18 36 45.01
32	18 44 05.48	6.11	− 23 03 44.2	43.6	11.051	+ 11.64	+ 3 23.9 5	16 17.11	1 11.02	18 40 41.57

Note.—For mean time interval of semidiameter passing meridian, subtract 0.19ˢ from the sidereal interval.

MOON-CULMINATIONS, 1902.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff.for 1 Hour of Long.	Right Ascension of Centre.	Diff.for 1 Hour of Long.	Geocentric Declination of Centre.	Diff.for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.	
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″		
Jan. 1	18 26.72	1.826	13 11 24.17	119.70	− 9 37 07.3	− 558.5	62.52	14 55.0	54 38.7	II.	S.
2	19 10.80	1.851	13 59 32.56	121.24	− 13 05 17.7	− 478.9	62.90	14 49.2	54 17.3	II.	S.
3	19 55.73	1.896	14 48 32.70	123.93	− 15 58 07.6	− 381.8	63.56	14 46.2	54 06.5	II.	S.
4	20 41.87	1.950	15 38 45.22	127.15	− 18 08 29.3	− 267.0	64.34	14 46.0	54 05.6	II.	S.
5	21 29.29	2.001	16 30 14.87	130.22	− 19 29 36.3	− 136.1	65.07	14 48.1	54 13.3	II.	S.
6	22 17.80	2.038	17 22 49.69	132.48	− 19 55 47.9	+ 6.7	65.59	14 52.2	54 28.2	II.	S.
7	23 06.96	2.055	18 16 04.02	133.46	− 19 23 34.3	154.6	65.79	14 57.7	54 48.6		
8	23 56.25	2.049	19 09 25.92	133.13	− 17 52 33.7	299.0	65.68	15 04.3	55 13.0		
10	0 45.19	2.028	20 02 27.12	131.84	− 15 26 01.3	430.8	65.36	15 11.8	55 40.2		
11	1 33.53	2.061	20 54 52.01	130.23	− 12 10 35.2	542.3	64.98	15 19.6	56 09.0	I.	S.
12	2 21.29	1.981	21 46 42.04	129.06	− 8 15 34.0	+ 628.0	64.73	15 27.7	56 38.8	I.	S.
13	3 08.79	1.981	22 38 16.21	129.01	− 3 52 09.2	683.8	64.79	15 36.0	57 09.3	I.	S.
14	3 56.58	2.007	23 30 08.02	130.60	+ 0 47 06.9	706.7	65.26	15 44.5	57 40.4	I.	S.
15	4 45.38	2.065	0 23 00.65	134.11	5 28 28.9	693.6	66.21	15 53.0	58 11.8	I.	S.
16	5 35.97	2.155	1 17 40.74	139.53	9 56 43.3	640.5	67.60	16 01.4	58 42.7	I.	S.
17	6 29.02	2.269	2 14 48.99	146.34	+ 13 54 53.8	+ 542.7	69.29	16 09.4	59 11.7	I.	S·
18	7 24.89	2.387	3 14 47.28	153.43	17 04 40.8	398.5	70.98	16 16.1	59 36.6	I.	S·
19	8 23.39	2.481	4 17 23.22	159.14	19 08 07.5	212.5	72.28	16 20.9	59 54.4	I.	S·
20	9 23.58	2.523	5 21 40.96	161.66	19 51 10.6	+ 0.1	72.81	16 23.0	60 02.0	I.	S·.
21	10 23.94	2.495	6 26 09.16	159.98	19 07 58.7	− 213.9	72.35	16 21.6	59 56.9	I.	S.
22	11 22.85	2.405	7 29 09.74	154.55	+ 17 03 25.1	− 402.5	71.02	16 16.5	59 38.1	I.	S.
23	12 19.10	2.279	8 29 30.54	146.97	13 51 55.2	− 546.4	69.18	16 07.9	59 06.5	II.	S.
24	13 12.19	2.147	9 26 41.64	139.03	9 53 14.3	− 638.3	67.23	15 56.5	58 24.7	II.	S.
25	14 02.28	2.031	10 20 51.40	132.04	5 27 48.9	− 681.1	65.50	15 43.4	57 36.7	II.	S.
26	14 49.89	1.942	11 12 32.65	126.73	+ 0 53 46.6	− 682.8	64.18	15 29.9	56 47.0	II.	S.
27	15 35.77	1.886	12 02 29.34	123.33	− 3 34 12.7	− 652.2	63.36	15 17.1	55 59.8	II.	S.
28	16 20.67	1.861	12 51 27.52	121.82	− 7 44 43.1	− 596.5	63.01	15 05.9	55 18.8	II.	S.
29	17 05.31	1.863	13 40 09.93	121.97	− 11 28 43.3	− 520.4	63.09	14 57.1	54 46.4	II.	S.
30	17 50.29	1.888	14 29 12.71	123.45	− 14 38 43.7	− 426.8	63.50	14 51.1	54 24.2	II.	S.
31	18 36.06	1.927	15 19 02.66	125.82	− 17 08 04.4	− 317.3	64.11	14 48.1	54 13.3	II.	S.
Feb. 1	19 22.86	1.973	16 09 54.78	128.54	− 18 50 37.5	− 193.1	64.79	14 48.1	54 13.5	II.	S.
2	20 10.71	2.014	17 01 50.66	131.03	− 19 40 56.5	− 56.6	65.38	14 51.1	54 24.2	II.	S.
3	20 59.44	2.044	17 54 38.86	132.82	− 19 34 50.9	+ 88.0	65.77	14 56.5	54 44.0	II.	S.
4	21 48.69	2.057	18 47 58.36	133.62	− 18 30 15.7	234.6	65.90	15 03.9	55 11.3	II.	S.
5	22 38.06	2.055	19 41 25.30	133.48	− 16 28 01.1	375.0	65.79	15 12.7	55 43.8	II.	S.
6	23 27.24	2.043	20 34 40.85	132.76	− 13 32 19.7	+ 500.3	65.56	15 22.2	56 18.9		
8	0 16.11	2.030	21 27 37.35	132.01	− 9 50 51.1	602.5	65.36	15 31.8	56 54.1		
9	1 04.77	2.027	22 20 21.50	131.81	− 5 34 18.3	674.7	65.34	15 40.9	57 27.4	I.	S.
10	1 53.56	2.042	23 13 13.56	132.72	− 0 55 53.8	711.1	65.61	15 49.0	57 57.0	I.	S.
11	2 42.99	2.081	0 06 43.98	135.05	+ 3 49 17.1	707.9	66.26	15 55.8	58 22.0	I.	S.
12	3 33.64	2.144	1 01 28.10	138.86	+ 8 24 47.8	+ 662.4	67.28	16 01.2	58 41.9	I.	S·
13	4 26.06	2.225	1 57 58.33	143.81	12 33 22.4	573.2	68.57	16 05.3	58 57.0	I.	S.
14	5 20.57	2.316	2 56 34.56	149.18	15 57 39.6	441.4	69.92	16 08.2	59 07.6	I.	S.
15	6 17.12	2.392	3 57 13.16	153.79	18 21 32.4	272.5	71.05	16 10.0	59 13.8	I.	S.
16	7 15.12	2.434	4 59 19.68	156.30	+ 19 32 17.0	+ 78.5	71.62	16 10.3	59 15.1	I.	S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 16	7 15.12	2.434	4 59 19.68	156.30	+ 19 32 17.0	+ 78.5	71.62	16 10.3	59 15.1	I. S.
17	8 13.56	2.426	6 01 51.86	155.82	19 23 10.9	− 123.2	71.45	16 09.0	59 10.6	I. S.
18	9 11.19	2.368	7 03 35.86	152.37	17 55 25.4	− 311.5	70.56	16 06.1	58 59.6	I. N.
19	10 06.98	2.277	8 03 29.05	146.81	15 18 05.8	− 468.6	69.14	16 01.1	58 41.4	I. N.
20	11 00.35	2.170	9 00 56.12	140.42	11 46 06.1	− 583.8	67.51	15 54.1	58 15.8	I. N. S.
21	11 51.19	2.069	9 55 51.93	134.36	+ 7 37 09.3	− 653.5	65.96	15 45.4	57 43.6	I. S.
22	12 39.83	1.987	10 48 34.65	129.43	+ 3 09 02.4	− 680.3	64.70	15 35.3	57 06.7	II. S.
23	13 26.78	1.929	11 39 35.78	125.94	− 1 22 04.1	− 669.4	63.82	15 24.6	56 27.6	II. S.
24	14 12.64	1.897	12 29 31.79	123.98	− 5 42 24.5	− 627.4	63.34	15 14.1	55 49.1	II. S.
25	14 58.02	1.888	13 18 58.28	123.45	− 9 40 39.2	− 559.9	63.26	15 04.6	55 14.1	II. S.
26	15 43.42	1.898	14 08 26.41	124.07	− 13 07 35.8	− 471.6	63.50	14 56.8	54 45.5	II. S.
27	16 29.25	1.922	14 58 20.23	125.53	− 15 55 41.8	− 366.3	63.95	14 51.4	54 25.4	II. S.
28	17 15.76	1.954	15 48 55.03	127.42	− 17 58 43.4	− 246.8	64.49	14 48.7	54 15.2	II. S.
Mar. 1	18 03.04	1.986	16 40 16.28	129.33	− 19 11 34.3	− 115.8	65.00	14 48.8	54 16.1	II. S.
2	18 51.03	2.012	17 32 20.08	130.91	− 19 30 22.7	+ 22.9	65.39	14 52.2	54 28.3	II. S.
3	19 39.55	2.029	18 24 55.50	131.95	− 18 52 48.3	+ 165.2	65.61	14 58.5	54 51.2	II. N.
4	20 28.36	2.037	19 17 48.79	132.42	− 17 18 28.2	305.6	65.67	15 07.2	55 23.5	II. N.
5	21 17.28	2.039	20 10 48.65	132.54	− 14 49 24.9	437.6	65.63	15 18.0	56 03.2	II. N.
6	22 06.24	2.042	21 03 50.88	132.69	− 11 30 29.6	553.7	65.61	15 30.0	56 47.4	II. N.
7	22 55.34	2.052	21 57 01.38	133.30	− 7 29 41.2	645.7	65.71	15 42.3	57 32.5	II. N.
8	23 44.84	2.077	22 50 36.54	134.80	− 2 58 16.7	+ 705.3	66.06	15 53.8	58 14.8	
10	0 35.17	2.121	23 45 01.11	137.45	+ 1 49 11.4	724.7	66.73	16 03.6	58 50.7	
11	1 26.80	2.184	0 40 43.70	141.27	6 35 18.4	697.6	67.71	16 10.9	59 17.4	I. S.
12	2 20.14	2.262	1 38 09.52	145.96	11 00 41.7	620.9	68.92	16 15.2	59 33.4	I. S.
13	3 15.40	2.342	2 37 30.95	150.75	14 45 34.1	495.9	70.16	16 16.6	59 38.5	I. S.
14	4 12.42	2.405	3 38 37.86	154.54	+ 17 31 55.5	+ 330.2	71.13	16 15.4	59 34.1	I. S.
15	5 10.56	2.432	4 40 52.06	156.18	19 06 11.3	+ 138.2	71.56	16 12.1	59 21.9	I. S.
16	6 08.79	2.413	5 43 12.44	155.01	19 21 33.5	− 60.9	71.30	16 07.2	59 04.1	I. S.
17	7 06.01	2.349	6 44 31.15	151.17	18 19 07.7	− 247.7	70.35	16 01.3	58 42.4	I. N.
18	8 01.29	2.255	7 43 53.80	145.55	16 07 06.3	− 406.8	68.93	15 54.7	58 18.0	I. N.
19	8 54.18	2.152	8 40 52.29	139.35	+ 12 58 34.4	− 529.3	67.34	15 47.5	57 51.6	I. N.
20	9 44.66	2.058	9 35 26.02	133.61	9 08 57.1	− 612.1	65.83	15 39.8	57 23.4	I. N.
21	10 33.06	1.981	10 27 54.83	129.01	4 54 02.9	− 656.1	64.59	15 31.8	56 53.7	I. N.
22	11 19.91	1.928	11 18 50.01	125.84	+ 0 28 52.7	− 664.0	63.72	15 23.5	56 23.1	I. N. S.
23	12 05.79	1.899	12 08 46.53	124.12	− 3 52 50.7	− 639.5	63.25	15 15.1	55 52.3	I. II. S.
24	12 51.24	1.892	12 58 17.76	123.70	− 7 58 55.5	− 586.4	63.15	15 07.0	55 22.6	II. S.
25	13 36.74	1.902	13 47 51.82	124.30	− 11 38 44.5	− 508.8	63.35	14 59.6	54 55.8	II. S.
26	14 22.63	1.923	14 37 49.15	125.57	− 14 43 14.4	− 410.5	63.74	14 53.6	54 33.6	II. S.
27	15 09.09	1.949	15 28 20.99	127.11	− 17 04 59.0	− 295.7	64.21	14 49.3	54 17.9	II. S.
28	15 56.16	1.973	16 19 29.22	128.54	− 18 38 12.7	− 168.7	64.65	14 47.3	54 10.6	II. S.
29	16 43.72	1.990	17 11 07.37	129.57	− 19 18 54.2	− 33.8	64.98	14 47.9	54 12.7	II. S.
30	17 31.59	1.999	18 03 04.32	130.10	− 19 04 52.5	+ 104.2	65.15	14 51.4	54 25.4	II. N. S.
31	18 19.58	2.000	18 55 08.21	130.19	− 17 55 47.6	240.7	65.18	14 57.8	54 49.0	II. N.
Apr. 1	19 07.57	1.999	19 47 11.81	130.13	− 15 53 10.9	371.0	65.14	15 07.1	55 23.1	II. N.
2	19 55.57	2.002	20 39 16.00	130.30	− 13 00 27.5	+ 490.3	65.15	15 18.9	56 06.5	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 2	19 55.57	2.002	20 39 16.00	130.30	− 13 00 27.5	+ 490.3	65.15	15 18.9	56 06.5	II. N.
3	20 43.76	2.016	21 31 31.99	131.17	− 9 23 08.6	592.9	65.32	15 32.6	56 56.6	II. N.
4	21 32.51	2.049	22 24 21.32	133.14	− 5 09 18.2	671.6	65.76	15 47.2	57 50.4	II. N.
5	22 22.30	2.105	23 18 13.85	136.47	− 0 30 11.1	717.7	66.54	16 01.5	58 43.0	II. N.
6	23 13.72	2.184	0 13 43.78	141.24	+ 4 19 11.5	721.3	67.69	16 14.2	59 29.6	
8	0 07.27	2.281	1 11 22.51	147.12	+ 8 59 55.2	+ 673.2	69.13	16 23.9	60 05.2	
9	1 03.27	2.384	2 11 28.13	153.29	13 10 11.1	568.7	70.64	16 29.5	60 25.9	
10	2 01.57	2.469	3 13 52.36	158.41	16 27 47.3	411.3	71.90	16 30.7	60 30.2	I. S.
11	3 01.45	2.511	4 17 51.18	160.94	18 34 08.0	215.7	72.56	16 27.6	60 18.7	I. S.
12	4 01.63	2.493	5 22 08.44	159.86	19 18 24.8	+ 5.5	72.37	16 20.9	59 54.3	I. S.
13	5 00.66	2.417	6 25 16.63	155.31	+ 18 39 53.7	− 194.2	71.34	16 11.8	59 20.9	I. N.
14	5 57.37	2.304	7 26 05.00	148.48	16 47 03.1	− 363.9	69.71	16 01.4	58 42.7	I. N.
15	6 51.16	2.179	8 23 57.79	140.93	13 54 06.9	− 493.9	67.85	15 50.6	58 02.8	I. N.
16	7 42.03	2.064	9 18 55.13	134.03	10 17 22.4	− 583.1	66.07	15 40.0	57 24.0	I. N.
17	8 30.42	1.973	10 11 22.70	128.55	6 12 38.5	− 634.5	64.60	15 30.0	56 47.5	I. N.
18	9 16.96	1.911	11 01 59.32	124.81	+ 1 54 15.3	− 652.1	63.56	15 20.9	56 14.0	I. N.
19	10 02.36	1.878	11 51 27.54	122.83	− 2 25 00.4	− 639.5	62.97	15 12.6	55 43.4	I. N.
20	10 47.29	1.870	12 40 27.21	122.40	− 6 33 38.0	− 599.3	62.80	15 05.2	55 16.3	I. N.
21	11 32.30	1.883	13 29 31.76	123.16	− 10 21 07.7	− 534.1	62.98	14 58.7	54 52.4	I. N.
22	12 17.79	1.909	14 19 05.31	124.73	− 13 37 55.8	− 446.3	63.39	14 53.3	54 32.5	II. S.
23	13 03.98	1.940	15 09 20.70	126.57	− 16 15 35.5	− 339.0	63.90	14 49.0	54 16.9	II. S.
24	13 50.87	1.967	16 00 18.67	128.19	− 18 07 08.3	− 216.5	64.38	14 46.3	54 06.7	II. S.
25	14 38.31	1.984	16 51 49.02	129.21	− 19 07 30.9	− 84.1	64.71	14 45.3	54 03.1	II. S.
26	15 25.99	1.988	17 43 34.59	129.45	− 19 13 54.4	+ 52.4	64.83	14 46.5	54 07.3	II. N.
27	16 13.63	1.980	18 35 16.99	128.98	− 18 25 50.9	187.2	64.77	14 50.0	54 20.5	II. N.
28	17 00.99	1.967	19 26 43.19	128.18	− 16 45 00.7	+ 315.5	64.62	14 56.3	54 43.4	II. N.
29	17 48.04	1.955	20 17 50.46	127.51	− 14 14 51.5	433.2	64.47	15 05.3	55 16.3	II. N.
30	18 34.95	1.956	21 08 48.98	127.54	− 11 00 20.0	536.8	64.48	15 16.9	55 59.0	II. N.
May 1	19 22.09	1.977	22 00 01.92	128.79	− 7 07 53.4	622.1	64.78	15 30.8	56 50.1	II. N.
2	20 10.05	2.024	22 52 03.70	131.66	− 2 45 53.2	683.4	65.47	15 46.3	57 47.1	II. N.
3	20 59.52	2.104	23 45 36.81	136.43	+ 1 54 32.6	+ 712.6	66.62	16 02.2	58 45.8	II. N.
4	21 51.26	2.213	0 41 26.32	142.99	6 38 28.7	699.0	68.20	16 17.3	59 41.1	II. N.
5	22 45.90	2.343	1 40 10.32	150.80	11 06 35.7	631.8	70.07	16 29.8	60 27.1	II. N.
6	23 43.72	2.473	2 42 05.19	158.60	14 55 55.4	504.7	71.92	16 38.2	60 57.9	
8	0 44.32	2.569	3 46 47.86	164.42	17 42 55.8	322.3	73.29	16 41.4	61 09.5	
9	1 46.51	2.600	4 53 06.03	166.29	+ 19 08 59.3	+ 104.5	73.76	16 39.0	61 00.6	I. N.
10	2 48.48	2.551	5 59 11.27	163.34	19 06 00.0	− 117.4	73.14	16 31.6	60 33.3	I. N.
11	3 48.44	2.437	7 03 14.92	156.45	17 38 34.2	− 313.4	71.58	16 20.4	59 52.4	I. N.
12	4 45.18	2.289	8 04 05.12	147.59	15 01 12.7	− 465.3	69.49	16 07.0	59 03.2	I. N.
13	5 38.34	2.143	9 01 20.12	138.79	11 32 48.5	− 568.8	67.34	15 52.8	58 11.1	I. N.
14	6 28.24	2.020	9 55 18.85	131.40	+ 7 32 00.2	− 628.4	65.46	15 39.0	57 20.4	I. N.
15	7 15.57	1.930	10 46 43.31	126.00	+ 3 14 55.9	− 651.4	64.03	15 26.4	56 34.0	I. N.
16	8 01.18	1.876	11 36 23.69	122.72	− 1 05 02.5	− 643.9	63.12	15 15.4	55 53.4	I. N.
17	8 45.88	1.854	12 25 09.44	121.40	− 5 16 44.3	− 610.5	62.69	15 06.1	55 19.3	I. N.
18	9 30.38	1.859	13 13 43.80	121.71	− 9 10 20.4	− 553.8	62.72	14 58 5	54 51.5	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff.for 1 Hour of Long.	Right Ascension of Center.	Diff.for 1 Hour of Long.	Geocentric Declination of Center.	Diff.for 1 Hour of Long.	Sid.Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	s	s	′ ″	′ ″	
May 18	9 30.38	1.859	13 13 43.80	121.71	− 9 10 20.4	− 553.8	62.72	14 58.5	54 51.5	I. N.
19	10 15.27	1.884	14 02 40.65	123.19	− 12 36 51.1	− 475.3	63.06	14 52.6	54 29.9	I. N.
20	11 00.88	1.919	14 52 21.79	125.30	− 15 27 53.1	− 376.7	63.57	14 48.2	54 13.9	I. N.
21	11 47.37	1.954	15 42 54.94	127.42	− 17 35 55.0	− 260.7	64.11	14 45.4	54 03.6	I. N.
22	12 34.60	1.980	16 34 13.51	128.98	− 18 54 49.8	− 132.0	64.53	14 44.1	53 58.6	II. N.
23	13 22.29	1.991	17 25 59.09	129.62	− 19 20 34.4	+ 3.9	64.72	14 44.3	53 59.4	II. N.
24	14 10.02	1.984	18 17 47.19	129.21	− 18 51 40.1	140.1	64.67	14 46.3	54 06.6	II. N.
25	14 57.42	1.964	19 09 15.29	128.03	− 17 29 20.8	270.0	64.42	14 50.1	54 20.9	II. N.
26	15 44.26	1.940	20 00 10.18	126.55	− 15 17 08.6	388.8	64.10	14 56.1	54 42.9	II. N.
27	16 30.56	1.921	20 50 32.62	125.43	− 12 20 22.1	492.5	63.86	15 04.4	55 13.3	II. N.
28	17 16.60	1.919	21 40 38.77	125.30	− 8 45 33.2	+ 578.5	63.88	15 15.1	55 52.2	II. N.
29	18 02.86	1.942	22 30 58.95	126.68	− 4 40 20.8	643.8	64.26	15 27.9	56 39.3	II. N.
30	18 50.06	1.997	23 22 15.18	130.02	− 0 13 50.4	683.9	65.11	15 42.5	57 33.1	II. N.
31	19 39.02	2.089	0 15 17.31	135.54	+ 4 22 34.3	691.9	66.49	15 58.2	58 30.8	II. N.
June 1	20 30.60	2.215	1 10 57.04	143.09	8 54 07.3	657.9	68.33	16 13.8	59 28.1	II. N.
2	21 25.51	2.363	2 09 56.96	152.02	+ 13 01 52.3	+ 571.3	70.45	16 27.7	60 19.4	II. N. ·
3	22 24.01	2.509	3 12 33.19	160.79	16 23 17.4	426.0	72.49	16 38.4	60 58.4	II. N.
4	23 25.59	2.613	4 18 14.83	167.06	18 35 30.8	+ 227.6	73.92	16 44.2	61 19.7	
6	0 28.80	2.639	5 25 34.46	168.66	19 21 19.0	− 0.9	74.29	16 44.2	61 19.7	
7	1 31.57	2.577	6 32 27.43	164.89	18 35 23.2	− 224.9	73.45	16 38.4	60 58.4	I. N.
8	2 31.95	2.446	7 36 56.65	157.05	+ 16 26 13.7	− 412.7	71.65	16 27.7	60 19.1	I. N.
9	3 28.77	2.287	8 37 51.94	147.49	13 12 18.4	− 547.5	69.40	16 13.6	59 27.5	I. N.
10	4 21.81	2.136	9 34 59.40	138.35	9 15 26.9	− 628.2	67.20	15 58.0	58 30.0	I. N.
11	5 11.51	2.012	10 28 46.43	130.91	4 55 49.6	− 662.9	65.35	15 42.3	57 32.1	I. N.
12	5 58.69	1.925	11 20 01.33	125.70	+ 0 29 55.2	− 661.3	64.00	15 27.6	56 38.1	I. N.
13	6 44.24	1.876	12 09 38.11	122.72	− 3 49 25.5	− 631.2	63.19	15 14.6	55 50.8	I. N.
14	7 29.00	1.859	12 58 27.87	121.74	− 7 51 59.8	− 578.0	62.89	15 04.0	55 11.8	I. N.
15	8 13.70	1.870	13 47 14.03	122.36	− 11 29 10.2	− 504.6	63.00	14 55.7	54 41.5	I. N.
16	8 58.89	1.898	14 36 29.20	124.06	− 14 33 11.0	− 412.5	63.39	14 49.8	54 19.8	I. N.
17	9 44.88	1.935	15 26 32.62	126.26	− 16 56 51.7	− 303.2	63.91	14 46.0	54 05.9	I. N.
18	10 31.74	1.969	16 17 28.40	128.30	− 18 33 50.1	− 179.5	64.40	14 44.3	53 59.2	I. N.
19	11 19.29	1.990	17 09 05.71	129.64	− 19 19 08.8	− 45.8	64.71	14 44.2	53 58.9	I. N.
20	12 07.16	1.995	18 01 02.43	129.89	− 19 10 01.1	+ 91.5	64.77	14 45.8	54 04.5	II. N.
21	12 54.91	1.982	18 52 52.03	129.07	− 18 06 22.5	225.5	64.57	14 48.8	54 15.7	II. N.
22	13 42.18	1.956	19 44 12.13	127.53	− 16 10 57.8	349.4	64.20	14 53.3	54 32.3	II. N.
23	14 28.76	1.927	20 34 51.63	125.80	− 13 28 57.4	+ 457.8	63.81	14 59.4	54 54.6	II. N.
24	15 14.74	1.907	21 24 54.58	124.58	− 10 07 17.1	547.2	63.54	15 07.0	55 22.8	II. N.
25	16 00.44	1.905	22 14 40.62	124.49	− 6 14 05.2	615.0	63.58	15 16.3	55 57.1	II. N.
26	16 46.42	1.931	23 04 43.18	126.04	− 1 58 27.4	658.8	64.03	15 27.4	56 37.6	II. N.
27	17 33.40	1.990	23 55 46.32	129.58	+ 2 29 16.9	674.8	64.98	15 39.9	57 23.6	II. N.
28	18 22.23	2.085	0 48 40.69	135.31	+ 6 56 56.8	+ 657.2	66.44	15 53.4	58 13.5	II. N.
29	19 13.75	2.213	1 44 16.87	143.00	11 09 35.9	598.4	68.35	16 07.4	59 04.6	II. N.
30	20 08.61	2.360	2 43 13.97	151.86	14 49 03.5	490.2	70.47	16 20.5	59 52.6	II. N.
July 1	21 06.98	2.500	3 45 42.42	160.27	17 34 39.5	329.2	72.41	16 31.3	60 32.4	II. N.
2	22 08.25	2.595	4 51 05.20	165.98	+ 19 06 28.4	+ 123.8	73.68	16 38.4	60 58.6	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff.for 1 Hour of Long.	Right Ascension of Centre.	Diff.for 1 Hour of Long.	Geocentric Declination of Centre.	Diff.for 1 Hour of Long.	Sid.Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 2	22 08.25	2.595	4 51 05.20	165.98	+ 19 06 28.4	+ 123.8	73.68	16 38.4	60 58.6	II. N.
3	23 10.93	2.613	5 57 52.72	167.09	19 10 53.2	− 102.6	73.91	16 40.6	61 06.7	
5	0 13.02	2.548	7 04 05.20	163.17	17 45 59.8	− 317.0	72.99	16 37.4	60 54.8	
6	1 12.76	2.422	8 07 55.62	155.60	15 02 51.8	− 490.1	71.24	16 29.0	60 23.9	
7	2 09.12	2.274	9 08 23.33	146.65	11 21 28.6	− 607.2	69.12	16 16.6	59 38.2	I. N.
8	3 01.97	2.134	10 05 19.46	138.24	+ 7 04 33.3	− 668.7	67.08	16 01.6	58 43.3	I. N.
9	3 51.76	2.021	10 59 11.81	131.46	+ 2 32 46.4	− 683.3	65.41	15 45.7	57 44.8	I. N.
10	4 39.27	1.943	11 50 46.42	126.78	− 1 57 12.2	− 661.4	64.24	15 30.3	56 48.3	I. N.
11	5 25.32	1.900	12 40 53.74	124.17	− 6 12 39.5	− 611.8	63.58	15 16.5	55 57.6	I. N.
12	6 10.71	1.887	13 30 20.90	123.37	− 10 03 49.9	− 540.7	63.37	15 05.0	55 15.4	I. N.
13	6 56.08	1.897	14 19 47.10	124.01	− 13 22 51.5	− 451.5	63.51	14 56.1	54 42.7	I. N.
14	7 41.90	1.923	15 09 40.73	125.57	− 16 02 59.1	− 346.5	63.88	14 49.9	54 20.1	I. N.
15	8 28.44	1.955	16 00 17.07	127.46	− 17 58 14.8	− 227.6	64.32	14 46.4	54 07.1	I. N.
16	9 15.70	1.982	16 51 37.14	129.11	− 19 03 38.3	− 97.7	64.68	14 45.4	54 03.4	I. N.
17	10 03.49	1.998	17 43 28.86	130.04	− 19 15 37.9	+ 38.5	64.86	14 46.5	54 07.5	I. N.
18	10 51.45	1.997	18 35 31.16	129.99	− 18 32 50.5	+ 175.1	64.80	14 49.5	54 18.3	I. N.
19	11 39.21	1.981	19 27 20.99	129.03	− 16 56 31.2	305.0	64.52	14 53.9	54 34.6	I. N.
20	12 26.47	1.956	20 18 40.78	127.56	− 14 30 38.9	421.7	64.14	14 59.6	54 55.6	II. N.
21	13 13.12	1.932	21 09 24.39	126.12	− 11 21 39.2	519.8	63.78	15 06.3	55 20.4	II. N.
22	13 59.31	1.919	21 59 39.65	125.31	− 7 37 50.1	595.2	63.61	15 14.0	55 48.5	II. N.
23	14 45.38	1.925	22 49 48.26	125.66	− 3 28 54.1	+ 645.0	63.77	15 22.5	56 19.8	II. N.
24	15 31.90	1.957	23 40 23.54	127.59	+ 0 54 19.4	666.2	64.33	15 31.8	56 53.8	II. N.
25	16 19.55	2.020	0 32 07.06	131.36	5 19 49.1	655.7	65.36	15 41.7	57 30.1	II. N.
26	17 09.09	2.113	1 25 43.79	136.99	9 34 01.9	609.0	66.83	15 52.1	58 08.3	II. N.
27	18 01.18	2.231	2 21 54.69	144.11	13 21 31.3	521.3	68.60	16 02.6	58 47.1	II. N.
28	18 56.27	2.358	3 21 05.31	151.76	+ 16 25 03.7	+ 389.0	70.47	16 12.7	59 24.0	II. N.
29	19 54.26	2.469	4 23 11.14	158.41	18 26 59.4	214.2	72.00	16 21.2	59 55.4	II. N.
30	20 54.41	2.533	5 27 26.41	162.26	19 12 20.2	+ 9.0	72.84	16 27.3	60 17.7	II. N.
31	21 55.32	2.530	6 32 27.43	162.11	18 33 10.2	− 203.8	72.75	16 29.9	60 27.3	II. N.
Aug. 1	22 55.36	2.463	7 36 36.17	158.05	16 31 57.9	− 396.6	71.75	16 28.3	60 21.3	II. N.
2	23 53.21	2.353	8 38 33.10	151.41	+ 13 21 33.4	− 547.0	70.15	16 22.3	59 59.4	
4	0 48.19	2.229	9 37 37.73	143.97	9 21 34.1	− 643.8	68.34	16 12.5	59 23.4	
5	1 40.29	2.116	10 33 48.88	137.15	4 53 35.2	− 687.7	66.68	15 59.9	58 37.0	I. N.
6	2 29.94	2.026	11 27 32.36	131.75	+ 0 17 28.2	− 686.0	65.36	15 45.7	57 44.8	I. N.
7	3 17.77	1.965	12 19 26.96	128.09	− 4 10 25.6	− 648.2	64.47	15 31.3	56 52.0	I. N.
8	4 04.49	1.932	13 10 14.19	126.11	− 8 17 25.7	− 582.8	64.01	15 17.9	56 02.9	I. N.
9	4 50.72	1.923	14 00 31.88	125.58	− 11 53 53.5	− 496.4	63.90	15 06.5	55 20.6	I. N.
10	5 36.95	1.932	14 50 50.36	126.11	− 14 52 22.1	− 393.5	64.06	14 57.4	54 47.5	I. N.
11	6 23.54	1.951	15 41 30.00	127.26	− 17 06 56.7	− 277.4	64.36	14 51.2	54 24.7	I. N.
12	7 10.64	1.973	16 32 39.92	128.55	− 18 32 53.2	− 150.8	64.67	14 47.9	54 12.7	I. N.
13	7 58.20	1.989	17 24 18.01	129.54	− 19 06 42.7	− 17.4	64.87	14 47.5	54 11.1	I. N.
14	8 46.05	1.996	18 16 13.11	129.93	− 18 46 30.3	+ 118.5	64.90	14 49.7	54 19.2	I. N.
15	9 33.91	1.991	19 08 09.49	129.65	− 17 32 19.6	251.4	64.76	14 54.1	54 35.5	I. N. S.
16	10 21.55	1.978	19 59 52.41	128.86	− 15 26 34.1	375.3	64.50	15 00.4	54 58.3	I. S.
17	11 08.84	1.962	20 51 13.62	127.92	− 12 34 05.0	+ 484.0	64.20	15 07.8	55 25.9	I. N. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff.for 1 Hour of Long.	Right Ascension of Centre.	Diff.for 1 Hour of Long.	Geocentric Declination of Centre.	Diff.for 1 Hour of Long.	Sid.Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 17	11 08.84	1.962	20 51 13.62	127.92	− 12 34 05.0	+ 484.0	64.20	15 07.8	55 25.9	I. N.S.
18	11 55.79	1.952	21 42 14.97	127.29	− 9 02 04.7	572.1	64.02	15 16.1	55 56.3	I. N.
19	12 42.63	1.954	22 33 09.67	127.45	− 4 59 53.4	634.3	64.08	15 24.8	56 28.0	II. N.
20	13 29.75	1.976	23 24 21.35	128.75	− 0 38 42.0	666.4	64.45	15 33.3	56 59.5	II. N.
21	14 17.68	2.022	0 16 21.54	131.50	+ 3 48 43.2	664.7	65.21	15 41.6	57 29.8	II. N.
22	15 07.00	2.092	1 09 45.56	135.74	+ 8 08 09.3	+ 626.0	66.35	15 49.4	57 58.2	II. N.
23	15 58.27	2.183	2 05 06.61	141.19	12 04 10.8	547.3	67.78	15 56.6	58 24.7	II. N.
24	16 51.86	2.283	3 02 47.41	147.23	15 20 35.9	428.0	69.30	16 03.1	58 48.6	II. N.
25	17 47.81	2.375	4 02 49.93	152.78	17 41 31.6	270.8	70.65	16 08.7	59 09.2	II. N.
26	18 45.66	2.438	5 04 46.88	156.55	18 53 22.6	+ 84.7	71.54	16 13.0	59 25.4	II. N.
27	19 44.47	2.454	6 07 41.74	157.49	+ 18 47 36.7	− 114.0	71.73	16 15.8	59 35.6	II. N.
28	20 43.03	2.419	7 10 21.62	155.34	17 23 14.1	− 304.6	71.16	16 16.4	59 37.8	II. S.
29	21 40.22	2.343	8 11 39.03	150.79	14 47 35.3	− 467.3	70.01	16 14.4	59 30.4	II. S.
30	22 35.32	2.247	9 10 50.44	145.06	11 14 56.9	− 588.0	68.57	16 09.6	59 12.4	II. S.
31	23 28.10	2.152	10 07 42.44	139.35	7 03 34.7	− 660.7	67.12	16 01.9	58 44.2	
Sept. 2	0 18.75	2.072	11 02 26.49	134.51	+ 2 32 40.5	− 686.3	65.89	15 51.8	58 07.4	
3	1 07.71	2.012	11 55 29.01	130.93	− 1 59 55.0	− 670.2	65.00	15 40.3	57 25.0	
4	1 55.52	1.975	12 47 21.99	128.68	− 6 18 55.1	− 619.6	64.48	15 28.1	56 40.4	I. N.
5	2 42.69	1.958	13 38 36.45	127.67	− 10 11 59.8	− 541.7	64.28	15 16.4	55 57.2	I. N.
6	3 29.65	1.957	14 29 37.95	127.57	− 13 29 35.2	− 443.3	64.30	15 05.9	55 18.8	I. N.
7	4 16.68	1.964	15 20 44.27	128.02	− 16 04 29.9	− 329.2	64.48	14 57.5	54 47.9	I. N.
8	5 03.94	1.975	16 12 04.37	128.65	− 17 51 31.8	− 204.5	64.68	14 51.6	54 26.5	I. N.
9	5 51.44	1.984	17 03 38.67	129.15	− 18 47 12.1	− 73.0	64.82	14 48.7	54 15.7	I. N.
10	6 39.08	1.986	17 55 21.07	129.31	− 18 49 39.7	+ 60.9	64.84	14 48.8	54 16.0	I. N.
11	7 26.69	1.981	18 47 02.36	129.06	− 17 58 42.8	193.2	64.74	14 51.9	54 27.2	I. S.
12	8 14.15	1.973	19 38 34.31	128.56	− 16 15 52.9	+ 319.5	64.55	14 57.6	54 48.3	I. S.
13	9 01.40	1.965	20 29 53.65	128.07	− 13 44 33.4	434.9	64.36	15 05.6	55 17.7	I. S.
14	9 48.51	1.963	21 21 04.69	127.94	− 10 30 06.0	534.2	64.27	15 15.3	55 53.2	I. S.
15	10 35.71	1.972	22 12 20.62	128.53	− 6 40 03.4	611.9	64.36	15 25.9	56 32.0	I. S.
16	11 23.34	2.000	23 04 02.89	130.18	− 2 24 18.2	661.7	64.75	15 36.6	57 11.5	I. N.S.
17	12 11.87	2.048	23 56 39.22	133.07	+ 2 04 48.0	+ 677.6	65.49	15 46.7	57 48.6	II. N.
18	13 01.80	2.117	0 50 39.96	137.20	6 32 28.8	653.8	66.56	15 55.5	58 20.7	II. N.
19	13 53.59	2.201	1 46 32.38	142.29	10 41 59.4	586.3	67.87	16 02.3	58 46.1	II. N.
20	14 47.51	2.291	2 44 32.69	147.71	14 15 35.8	474.5	69.27	16 07.2	59 04.0	II. N.
21	15 43.49	2.370	3 44 37.19	152.45	16 56 14.8	322.8	70.48	16 10.2	59 14.6	II. N.
22	16 41.03	2.419	4 46 15.81	155.37	+ 18 29 54.8	+ 141.9	71.23	16 11.3	59 18.6	II. N.
23	17 39.23	2.424	5 48 34.04	155.65	18 48 05.1	− 51.6	71.32	16 10.7	59 16.5	II. N.
24	18 37.00	2.383	6 50 25.88	153.22	17 49 31.6	− 236.8	70.73	16 08.7	59 09.2	II. S.
25	19 33.35	2.309	7 50 53.04	148.77	15 40 22.1	− 402.1	69.62	16 05.4	58 57.2	II. S.
26	20 27.71	2.220	8 49 19.95	143.41	12 32 33.2	− 530.4	68.25	16 00.8	58 40.4	II. S.
27	21 19.92	2.134	9 45 38.01	138.20	+ 8 41 28.9	− 617.9	66.88	15 54.9	58 18.8	II. S.
28	22 10.22	2.062	10 40 00.53	133.88	+ 4 23 51.1	− 663.3	65.73	15 47.7	57 52.4	II. S.
29	22 59.03	2.010	11 32 53.77	130.79	− 0 03 52.9	− 668.8	64.90	15 39.3	57 21.5	II. S.
30	23 46.87	1.980	12 24 48.56	128.98	− 4 26 26.6	− 638.2	64.42	15 30.0	56 47.5	
Oct. 2	0 34.22	1.968	13 16 13.90	128.28	− 8 30 18.7	− 576.2	64.26	15 20.4	56 12.0	

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.	
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″		
Oct. 2	0 34.22	1.968	13 16 13.90	128.28	− 8 30 18.7	− 576.2	64.26	15 20.4	56 12.0		
3	1 21.46	1.970	14 07 32.62	128.36	− 12 04 00.3	− 488.3	64.31	15 11.0	55 37.3	I.	N.
4	2 08.83	1.978	14 58 58.88	128.84	− 14 58 19.4	− 380.3	64.50	15 02.4	55 05.7	I.	N.
5	2 56.39	1.986	15 50 37.18	129.31	− 17 06 25.1	− 258.2	64.69	14 55.3	54 39.5	I.	N.
6	3 44.09	1.988	16 42 23.34	129.46	− 18 23 47.6	− 127.8	64.79	14 50.3	54 21.4	I.	N.
7	4 31.75	1.983	17 34 07.52	129.13	− 18 48 12.4	+ 5.7	64.76	14 47.8	54 12.4	I.	N.
8	5 19.20	1.970	18 25 38.52	128.38	− 18 19 28.3	137.3	64.59	14 48.2	54 13.9	I.	S.
9	6 06.29	1.954	19 16 48.35	127.42	− 16 59 08.2	263.1	64.35	14 51.7	54 26.6	I.	S.
10	6 53.01	1.940	20 07 35.92	126.60	− 14 50 14.3	379.6	64.12	14 58.2	54 50.3	I.	S.
11	7 39.50	1.936	20 58 09.38	126.31	− 11 57 06.8	483.7	64.00	15 07.2	55 24.2	I.	S.
12	8 26.04	1.946	21 48 46.38	126.95	− 8 25 30.8	+ 571.2	64.13	15 18.9	56 06.3	I.	S.
13	9 13.09	1.978	22 39 53.21	128.83	− 4 22 58.6	637.3	64.55	15 31.8	56 53.9	I.	S.
14	10 01.17	2.033	23 32 02.71	132.20	+ 0 00 34.2	675.1	65.34	15 45.3	57 43.4	I.	S.
15	10 50.89	2.114	0 25 50.74	137.05	4 32 10.0	676.1	66.52	15 58.2	58 30.7	I.	S.
16	11 42.80	2.214	1 21 50.35	143.08	8 55 30.4	632.5	68.01	16 09.3	'59 11.3	I. II. N. S.	
17	12 37.25	2.323	2 20 22.82	149.61	+ 12 51 25.7	+ 538.5	69.62	16 17.4	59 41.4	II. N.	
18	13 34.21	2.420	3 21 26.27	155.43	15 59 43.6	395.2	71.05	16 22.0	59 58.5	II. N.	
19	14 33.10	2.480	4 24 25.97	159.06	18 02 24.6	213.1	71.97	16 23.0	60 02.1	II. N.	
20	15 32.81	2.485	5 28 14.85	159.40	18 47 36.6	+ 11.7	72.12	16 20.7	59 53.4	II. N. S.	
21	16 31.96	2.434	6 31 29.95	156.32	18 12 23.6	− 185.1	71.45	16 15.6	59 34.9	II. S.	
22	17 29.33	2.341	7 32 58.21	150.73	+ 16 22 53.6	− 356.9	70.14	16 08.8	59 09.6	II. S.	
23	18 24.21	2.231	8 31 56.78	144.11	13 31 48.5	− 491.8	68.52	16 00.8	58 40.2	II. S.	
24	19 16.47	2.126	9 28 17.66	137.80	9 54 57.9	− 585.8	66.93	15 52.2	58 08.9	II. S.	
25	20 06.43	2.041	10 22 20.01	132.66	5 48 36.9	− 639.8	65.56	15 43.5	57 37.1	II. S.	
26	20 54.66	1.982	11 14 38.16	129.12	+ 1 28 06.0	− 657.0	64.59	15 34.9	57 05.5	II. S.	
27	21 41 81	1.950	12 05 51.26	127.22	− 2 52 33.8	640.9	64.03	15 26.5	56 34.5	II. S.	
28	22 28.49	1.942	12 56 36.11	126.73	− 7 00 38.2	594.6	63.85	15 18.3	56 04.3	II. S.	
29	23 15.18	1.951	13 47 22.06	127.24	− 10 44 36.8	521.0	63.95	15 10.4	55 35.2		
31	0 02.20	1.968	14 38 27.73	128.28	− 13 54 22.1	424.1	64.22	15 03.0	55 08.0		
Nov. 1	0 49.66	1.985	15 29 59.24	129.31	− 16 21 30.7	308.8	64.49	14 56.4	54 43.9		
2	1 37.44	1.994	16 21 50.49	129.86	− 17 59 49.4	− 181.1	64.71	14 51.0	54 24.0	I.	N.
3	2 25.29	1.991	17 13 45.91	129.63	− 18 45 39.6	− 47.5	64.73	14 47.3	54 10.2	I.	N.
4	3 12.89	1.974	18 05 26.18	128.60	− 18 38 00.8	+ 85.3	64.53	14 45.6	54 04.0	I.	S.
5	3 59.96	1.948	18 56 34.73	127.04	− 17 38 15.8	212.0	64.18	14 46.3	54 06.7	I.	S.
6	4 46.37	1.920	19 47 03.52	125.38	− 15 49 39.7	329.0	63.80	14 49.8	54 19.6	I.	S.
7	5 32.18	1.900	20 36 56.40	124.15	− 13 16 43.4	+ 433.5	63.50	14 56.3	54 43.2	I.	S.
8	6 17.67	1.895	21 26 29.85	123.85	− 10 04 51.1	523.4	63.42	15 05.6	55 17.5	I.	S.
9	7 03.30	1.913	22 16 11.87	124.93	− 6 20 18.6	596.2	63.69	15 17.6	56 01.7	I.	S.
10	7 49.70	1.959	23 06 40.07	127.73	− 2 10 40.8	647.9	64.38	15 31.8	56 53.9	I.	S.
11	8 37.61	2.038	23 58 38.62	132.47	+ 2 14 20.3	671.8	65.54	15 47.4	57 51.0	I.	S.
12	9 27.78	2.148	0 52 53.76	139.09	+ 6 41 52.3	+ 658.8	67.15	16 03.0	58 48.5	I.	S.
13	10 20.89	2.281	1 50 05.89	147.09	10 55 03.5	598.5	69.07	16 17.2	59 40.9	I.	S.
14	11 17.31	2.419	2 50 36.53	155.37	14 33 19.5	483.4	71.03	16 28.5	60 22.4	I.	S.
15	12 16.79	2.531	3 54 11.82	162.13	17 14 37.7	314.9	72.62	16 35.5	60 48.0	II.	S.
16	13 18.33	2.585	4 59 50.73	165.37	+ 18 40 09.3	+ 108.3	73.42	16 37.4	60 54.8	II.	S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff.for 1 Hour of Long.	Right Ascension of Centre.	Diff.for 1 Hour of Long.	Geocentric Declination of Centre.	Diff.for 1 Hour of Long.	Sid.Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.	
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″		
Nov. 16	13 18.33	2.585	4 59 50.73	165.37	+ 18 40 09.3	+ 108.3	73.42	16 37.4	60 54.8	II.	S.
17	14 20.25	2.562	6 05 52.58	163.98	18 39 54.3	− 108.6	73.15	16 34.2	60 43.0	II.	S.
18	15 20.74	2.470	7 10 28.53	158.44	17 15 55.3	− 305.8	71.91	16 26.6	60 15.3	II.	S.
19	16 18.47	2.338	8 12 18.77	150.52	14 40 45.7	− 462.2	70.08	16 16.0	59 36.4	II.	S.
20	17 12.92	2.200	9 10 51.17	142.25	11 12 38.4	− 570.3	68.10	16 03.8	58 51.4	II.	S.
21	18 04.26	2.082	10 06 16.33	135.10	+ 7 10 36.8	− 632.6	66.31	15 51.1	58 04.8	II.	S.
22	18 53.09	1.993	10 59 11.02	129.79	+ 2 51 46.2	− 655.5	64.93	15 38.8	57 19.7	II.	S.
23	19 40.22	1.939	11 50 22.65	126.51	− 1 29 26.4	− 645.5	64.04	15 27.6	56 38.2	II.	S.
24	20 26.41	1.916	12 40 38.75	125.12	− 5 40 49.3	− 607.1	63.61	15 17.5	56 01.4	II.	S.
25	21 12.37	1.918	13 30 40.44	125.24	− 9 31 46.0	− 543.6	63.56	15 08.8	55 29.5	II.	S.
26	21 58.60	1.937	14 20 58.32	126.37	− 12 52 46.1	− 457.8	63.80	15 01.4	55 02.2	II.	S.
27	22 45.38	1.962	15 11 49.46	127.90	− 15 35 20.4	− 352.1	64.15	14 55.2	54 39.5	II.	S.
28	23 32.75	1.984	16 03 15.90	129.20	− 17 32 23.4	− 230.9	64.47	14 50.3	54 21.3		
30	0 20.51	1.993	16 55 05.43	129.77	− 18 38 45.6	− 99.9	64.62	14 46.6	54 07.7		
Dec. 1	1 08.27	1.985	17 46 55.96	129.26	− 18 51 52.4	+ 34.2	64.53	14 44.3	53 59.3		
2	1 55.65	1.960	18 38 22.63	127.80	− 18 11 55.6	+ 164.3	64.21	14 43.6	53 56.8	I.	S.
3	2 42.29	1.926	19 29 05.76	125.73	− 16 41 42.9	284.7	63.73	14 44.8	54 01.3	I.	S.
4	3 28.08	1.891	20 18 57.20	123.61	− 14 25 57.1	391.6	63.23	14 48.2	54 13.8	I.	S.
5	4 13.12	1.865	21 08 03.20	122.04	− 11 30 33.1	482.7	62.88	14 54.1	54 35.5	I.	S.
6	4 57.74	1.858	21 56 44.48	121.63	− 8 02 05.7	556.7	62.82	15 02.6	55 06.9	I.	S.
7	5 42.51	1.878	22 45 34.31	122.83	− 4 07 39.8	+ 612.1	63.17	15 13.9	55 48.0	I.	S.
8	6 28.14	1.931	23 35 16.19	126.02	+ 0 04 44.3	645.8	64.01	15 27.6	56 38.2	I.	S.
9	7 15.47	2.020	0 26 40.67	131.41	4 25 24.4	652.2	65.37	15 43.2	57 35.6	I.	S.
10	8 05.40	2.146	1 20 40.82	138.95	8 41 46.6	622.7	67.23	15 59.8	58 36.7	I.	S.
11	8 58.68	2.298	2 18 03.26	148.12	12 37 26.8	547.0	69.44	16 16.1	59 36.7	I.	S.
12	9 55.75	2.456	3 19 13.20	157.61	+ 15 52 06.8	+ 416.9	71.65	16 30.4	60 29.1	I.	S.
13	10 56.32	2.583	4 23 54.12	165.29	18 03 46.6	233.3	73.40	16 40.8	61 07.3	I.	S.
14	11 59.20	2.641	5 30 53.89	168.83	18 53 56.0	+ 13.6	74.20	16 45.9	61 26.0	II.	S.
15	13 02.44	2.612	6 38 14.99	167.03	18 44 07.1	− 210.4	73.81	16 44.9	61 22.5	II.	S.
16	14 03.98	2.506	7 43 54.24	160.64	16 09 35.3	− 404.8	72.38	16 38.2	60 57.6	II.	S.
17	15 02.41	2.360	8 46 26.31	151.85	+ 12 57 08.5	− 547.8	70.34	16 26.6	60 15.5	II.	S.
18	15 57.25	2.212	9 45 21.97	142.93	8 58 53.5	− 634.3	68.22	16 12.2	59 22.5	II.	S.
19	16 48.77	2.087	10 40 58.07	135.40	4 36 28.5	− 670.3	66.39	15 56.6	58 25.1	II.	S.
20	17 37.68	1.996	11 33 57.41	129.92	+ 0 08 03.3	− 665.9	65.02	15 41.2	57 28.4	II.	S.
21	18 24.84	1.940	12 25 11.39	126.60	− 4 12 08.2	− 630.3	64.15	15 27.0	56 36.1	II.	S.
22	19 11.07	1.917	13 15 29.48	125.21	− 8 12 57.8	− 570.0	63.74	15 14.6	55 50.7	II.	S.
23	19 57.07	1.919	14 05 33.23	125.32	− 11 45 24.2	− 489.0	63.71	15 04.3	55 13.1	II.	S.
24	20 43.32	1.937	14 55 52.54	126.40	− 14 41 43.6	− 389.9	63.94	14 56.3	54 43.5	II.	S.
25	21 30.09	1.961	15 46 43.12	127.81	− 16 55 15.1	− 275.5	64.25	14 50.4	54 21.6	II.	S.
26	22 17.39	1.979	16 38 05.35	128.93	− 18 20 33.2	− 149.5	64.47	14 46.2	54 06.5	II.	S.
27	23 04.99	1.985	17 29 45.80	129.26	− 18 53 59.8	− 17.2	64.51	14 43.8	53 57.7		
28	23 52.52	1.973	18 21 22.02	128.57	− 18 34 18.0	+ 115.1	64.31	14 43.0	53 54.5		
30	0 39.58	1.946	19 12 29.79	126.94	− 17 22 51.7	240.5	63.89	14 43.6	53 56.8		
31	1 25.87	1.910	20 02 51.05	124.78	− 15 23 35.0	+ 353.4	63.37	14 45.8	54 04.7	I.	S.

MERCURY, 1902.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 1	0 02.7	18 44 22.94	−24 49 16.0	6.1	2.3	0.17	Feb.15	0 34.1	22 13 19.52	− 7 18 46.3	13.1	4.9	0.33
2	0 05.9	18 51 29.75	24 44 49.0	6.1	2.3	0.17	16	0 26.4	22 09 32.58	7 32 13.9	13.3	4.9	0.33
3	0 09.1	18 58 37.47	24 38 52.3	6.1	2.3	0.17	17	0 18.5	22 05 30.15	7 49 15.3	13.4	5.0	0.34
4	0 12.3	19 05 45.95	24 31 25.0	6.2	2.3	0.17	18	0 10.4	22 01 18.52	8 09 17.5	13.6	5.0	0.34
5	0 15.5	19 12 55.03	24 22 26.4	6.2	2.4	0.17	19	0 02.2	21 57 04.13	8 31 44.5	13.7	5.1	0.35
6	0 18.7	19 20 04.55	−24 11 55.6	6.2	2.4	0.17	19	23 54.1	21 52 53.18	− 8 55 58.3	13.8	5.2	0.35
7	0 21.9	19 27 14.40	23 59 51.5	6.2	2.4	0.17	20	23 46.2	21 48 51.46	9 21 21.2	13.8	5.2	0.35
8	0 25.1	19 34 24.34	23 46 13.9	6.3	2.4	0.17	21	23 38.5	21 45 04.14	9 47 16.3	13.7	5.2	0.35
9	0 28.3	19 41 34.19	23 31 02.1	6.3	2.4	0.17	22	23 31.1	21 41 35.56	10 13 11.0	13.7	5.2	0.35
10	0 31.5	19 48 43.75	23 14 15.5	6.3	2.4	0.17	23	23 24.1	21 38 29.19	10 38 36.2	13.6	5.1	0.35
11	0 34.7	19 55 52.74	−22 55 54.0	6.4	2.4	0.17	24	23 17.5	21 35 47.68	−11 03 07.3	13.5	5.1	0.35
12	0 37.9	20 03 00.96	22 35 57.2	6.4	2.4	0.17	25	23 11.3	21 33 32.76	11 26 24.3	13.3	5.0	0.34
13	0 41.1	20 10 08.12	22 14 25.2	6.5	2.4	0.17	26	23 05.6	21 31 45.43	11 48 11.7	13.1	5.0	0.34
14	0 44.2	20 17 13.92	21 51 18.7	6.5	2.4	0.18	27	23 00.3	21 30 26.03	12 08 17.4	12.9	4.9	0.34
15	0 47.3	20 24 17.97	21 26 37.8	6.6	2.5	0.18	28	22 55.5	21 29 34.39	12 26 32.7	12.7	4.8	0.33
16	0 50.4	20 31 19.94	−21 00 23.5	6.6	2.5	0.18	Mar. 1	22 51.2	21 29 09.93	−12 42 52.3	12.5	4.7	0.33
17	0 53.5	20 38 19.41	20 32 36.9	6.7	2.5	0.18	2	22 47.3	21 29 11.82	12 57 12.5	12.3	4.7	0.33
18	0 56.5	20 45 15.83	20 03 19.9	6.8	2.6	0.18	3	22 43.8	21 29 38.96	13 09 31.5	12.1	4.6	0.32
19	0 59.4	20 52 08.70	19 32 34.9	6.8	2.6	0.18	4	22 40.7	21 30 30.07	13 19 49.1	11.9	4.5	0.32
20	1 02.2	20 58 57.36	19 00 24.4	6.9	2.7	0.19	5	22 38.0	21 31 43.77	13 28 05.9	11.7	4.4	0.31
21	1 05.0	21 05 41.14	−18 26 52.3	7.0	2.7	0.19	6	22 35.6	21 33 18.72	−13 34 23.0	11.4	4.3	0.30
22	1 07.7	21 12 19.25	17 52 02.9	7.1	2.7	0.19	7	22 33.6	21 35 13.46	13 38 42.5	11.2	4.3	0.30
23	1 10.3	21 18 50.66	17 16 01.4	7.2	2.8	0.19	8	22 31.9	21 37 26.65	13 41 06.4	11.0	4.2	0.29
24	1 12.7	21 25 14.42	16 38 54.4	7.3	2.8	0.20	9	22 30.5	21 39 56.95	13 41 37.0	10.8	4.2	0.29
25	1 15.0	21 31 29.28	16 00 49.8	7.4	2.9	0.20	10	22 29.3	21 42 43.14	13 40 16.6	10.6	4.1	0.28
26	1 17.1	21 37 33.96	−15 21 56.8	7.6	2.9	0.20	11	22 28.4	21 45 44.07	−13 37 07.9	10.4	4.0	0.27
27	1 19.0	21 43 26.84	14 42 26.7	7.7	2.9	0.20	12	22 27.7	21 48 58.65	13 32 13.3	10.2	4.0	0.26
28	1 20.7	21 49 06.24	14 02 32.0	7.9	3.0	0.21	13	22 27.2	21 52 25.84	13 25 35.1	10.0	3.9	0.26
29	1 22.2	21 54 30.33	13 22 27.4	8.1	3.0	0.21	14	22 26.9	21 56 04.70	13 17 15.6	9.8	3.9	0.26
30	1 23.3	21 59 36.96	12 42 29.2	8.3	3.1	0.22	15	22 26.8	21 59 54.34	13 07 17.2	9.6	3.8	0.25
31	1 24.2	22 04 23.88	−12 02 56.6	8.5	3.2	0.22	16	22 26.8	22 03 54.02	−12 55 41.5	9.5	3.7	0.25
Feb. 1	1 24.7	22 08 48.71	11 24 10.5	8.8	3.3	0.22	17	22 27.0	22 08 02.98	12 42 30.9	9.4	3.7	0.25
2	1 24.7	22 12 48.95	10 46 32.5	9.0	3.4	0.23	18	22 27.4	22 12 20.56	12 27 47.3	9.3	3.6	0.24
3	1 24.3	22 16 21.97	10 10 27.6	9.3	3.5	0.23	19	22 27.9	22 16 46.17	12 11 32.3	9.2	3.6	0.24
4	1 23.4	22 19 25.22	9 36 21.0	9.6	3.6	0.24	20	22 28.5	22 21 19.27	11 53 47.9	9.1	3.5	0.23
5	1 22.0	22 21 56.20	− 9 04 39.0	9.9	3.7	0.25	21	22 29.2	22 25 59.35	−11 34 35.6	8.9	3.4	0.23
6	1 20.1	22 23 52.56	8 35 47.9	10.2	3.8	0.25	22	22 30.0	22 30 46.01	11 13 57.1	8.8	3.4	0.23
7	1 17.4	22 25 12.34	8 10 13.7	10.5	4.0	0.26	23	22 30.9	22 35 38.84	10 51 53.8	8.7	3.3	0.22
8	1 14.2	22 25 53.99	7 48 20.5	10.8	4.1	0.27	24	22 31.9	22 40 37.49	10 28 27.3	8.6	3.3	0.22
9	1 10.3	22 25 56.55	7 30 30.0	11.1	4.2	0.28	25	22 33.0	22 45 41.68	10 03 39.0	8.5	3.2	0.21
10	1 05.7	22 25 19.73	− 7 17 00.2	11.5	4.4	0.29	26	22 34.3	22 50 51.10	− 9 37 30.3	8.3	3.1	0.21
11	1 00.6	22 24 04.15	7 08 03.9	11.8	4.5	0.29	27	22 35.7	22 56 05.56	9 10 02.5	8.2	3.1	0.21
12	0 54.8	22 22 11.34	7 03 48.8	12.1	4.6	0.30	28	22 37.1	23 01 24.85	8 41 16.8	8.1	3.1	0.21
13	0 48.4	22 19 43.79	7 04 16.4	12.4	4.7	0.31	29	22 38.6	23 06 48.81	8 11 14.6	8.0	3.0	0.21
14	0 41.5	22 16 45.00	7 09 20.2	12.7	4.8	0.32	30	22 40.1	23 12 17.31	7 39 57.0	7.9	3.0	0.20
15	0 34.1	22 13 19.52	− 7 18 46.3	13.1	4.9	0.33	31	22 41.6	23 17 50.25	7 07 25.2	7.8	3.0	0.20
16	0 26.4	22 09 32.58	− 7 32 13.9	13.3	4.9	0.33	Apr. 1	22 43.2	23 23 27.56	− 6 33 40.5	7.7	3.0	0.20

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	22 43.2	23 23 27.56	− 6 33 40.5	7.7	3.0	0.20	May 17	1 16.2	4 54 14.92	+24 52 29.5	8.3	3.2	0.23
2	22 44.9	23 29 09.20	5 58 44.0	7.6	2.9	0.20	18	1 19.2	5 01 13.82	25 04 50.3	8.5	3.2	0.24
3	22 46.7	23 34 55.12	5 22 36.9	7.5	2.8	0.19	19	1 22.0	5 07 59.50	25 14 55.6	8.7	3.3	0.24
4	22 48.6	23 40 45.38	4 45 20.5	7.4	2.8	0.19	20	1 24.6	5 14 31.40	25 22 50.3	8.9	3.3	0.25
5	22 50.7	23 46 39.97	4 06 55.9	7.4	2.8	0.19	21	1 27.0	5 20 49.04	25 28 40.2	9.1	3.4	0.25
6	22 52.8	23 52 38.93	− 3 27 24.5	7.3	2.8	0.19	22	1 29.1	5 26 51.97	+25 32 31.2	9.3	3.5	0.26
7	22 54.9	23 58 42.36	2 46 47.4	7.3	2.7	0.19	23	1 31.0	5 32 39.72	25 34 29.0	9.5	3.6	0.26
8	22 57.1	0 04 50.33	2 05 06.2	7.2	2.7	0.19	24	1 32.6	5 38 11.83	25 34 39.4	9.7	3.7	0.27
9	22 59.3	0 11 02.99	1 22 22.4	7.2	2.7	0.18	25	1 33.9	5 43 27.91	25 33 08.6	9.9	3.8	0.28
10	23 01.6	0 17 20.42	−− 0 38 37.4	7.1	2.7	0.18	26	1 34.9	5 48 27.59	25 30 02.2	10.2	3.9	0.28
11	23 04.0	0 23 42.78	+ 0 06 07.0	7.1	2.7	0.18	27	1 35.6	5 53 10.46	+25 25 26.1	10.4	4.0	0.29
12	23 06.5	0 30 10.32	0 51 49.0	7.1	2.7	0.18	28	1 36.0	5 57 36.12	25 19 26.0	10.7	4.1	0.30
13	23 09.1	0 36 43.19	1 38 26.8	7.0	2.7	0.18	29	1 36.1	6 01 44.17	25 12 07.5	10.9	4.2	0.31
14	23 11.8	0 43 21.57	2 25 57.7	7.0	2.6	0.17	30	1 36.1	6 05 34.27	25 03 36.4	11.1	4.3	0.31
15	23 14.6	0 50 05.68	3 14 19.4	6.9	2.6	0.17	31	1 35.8	6 09 06.09	24 53 58.0	11.4	4.3	0.32
16	23 17.5	0 56 55.73	+ 4 03 29.1	6.9	2.6	0.17	June 1	1 35.1	6 12 19.24	+24 43 17.8	11.6	4.4	0.33
17	23 20.5	1 03 51.92	4 53 23.1	6.8	2.6	0.17	2	1 34.1	6 15 13.42	24 31 41.0	11.9	4.5	0.33
18	23 23.6	1 10 54.49	5 43 57.9	6.8	2.6	0.17	3	1 32.7	6 17 48.30	24 19 12.9	12.2	4.6	0.34
19	23 26.8	1 18 03.59	6 35 09.2	6.8	2.5	0.17	4	1 31.0	6 20 03.62	24 05 58.4	12.5	4.7	0.34
20	23 30.1	1 25 19.44	7 26 52.1	6.7	2.5	0.17	5	1 29.0	6 21 59.12	23 52 02.9	12.8	4.8	0.35
21	23 33.5	1 32 42.18	+ 8 19 01.3	6.7	2.5	0.17	6	1 26.7	6 23 34.60	+23 37 31.1	13.0	4.9	0.36
22	23 37.0	1 40 11.93	9 11 30.3	6.7	2.5	0.17	7	1 24.0	6 24 49.93	23 22 28.2	13.3	5.0	0.36
23	23 40.7	1 47 48.74	10 04 12.6	6.6	2.5	0.17	8	1 21.0	6 25 45.08	23 06 59.5	13.5	5.1	0.37
24	23 44.5	1 55 32.60	10 56 59.8	6.6	2.5	0.17	9	1 17.6	6 26 20.13	22 51 09.8	13.8	5.2	0.38
25	23 48.4	2 03 23.42	11 49 43.9	6.6	2.5	0.17	10	1 13.9	6 26 35.22	22 35 04.2	14.1	5.3	0.39
26	23 52.4	2 11 21.05	+12 42 14.6	6.6	2.5	0.17	11	1 09.9	6 26 30.68	+22 18 48.0	14.3	5.4	0.39
27	23 56.5	2 19 25.15	13 34 21.3	6.6	2.5	0.17	12	1 05.6	6 26 06.96	22 02 26.1	14.6	5.5	0.40
29	0 00.7	2 27 35.36	14 25 53.0	6.7	2.5	0.18	13	1 01.0	6 25 24.70	21 46 04.3	14.8	5.6	0.40
30	0 05.0	2 35 51.11	15 16 37.4	6.7	2.5	0.18	14	0 56.1	6 24 24.71	21 29 47.9	15.0	5.7	0.41
May 1	0 09.4	2 44 11.76	16 06 23.0	6.7	2.5	0.18	15	0 50.8	6 23 08.07	21 13 43.0	15.2	5.8	0.41
2	0 13.8	2 52 36.49	+16 54 56.3	6.8	2.6	0.18	16	0 45.3	6 21 36.04	+20 57 55.3	15.3	5.8	0.42
3	0 18.2	3 01 04.36	17 42 04.8	6.8	2.6	0.18	17	0 39.6	6 19 50.09	20 42 31.0	15.5	5.9	0.42
4	0 22.7	3 09 34.35	18 27 36.3	6.9	2.6	0.18	18	0 33.7	6 17 51.91	20 27 36.4	15.6	5.9	0.42
5	0 27.3	3 18 05.35	19 11 19.2	7.0	2.7	0.19	19	0 27.7	6 15 43.37	20 13 18.1	15.7	6.0	0.43
6	0 32.0	3 26 36.10	19 53 02.5	7.0	2.7	0.19	20	0 21.5	6 13 26.55	19 59 42.4	15.8	6.0	0.43
7	0 36.6	3 35 05.38	+20 32 36.6	7.1	2.7	0.19	21	0 15.2	6 11 03.63	+19 46 56.0	15.8	6.0	0.43
8	0 41.1	3 43 31.86	21 09 53.0	7.2	2.7	0.19	22	0 08.8	6 08 36.97	19 35 05.0	15.7	6.0	0.43
9	0 45.5	3 51 54.32	21 44 45.7	7.3	2.8	0.19	23	0 02.4	6 06 08.93	19 24 15.9	15.7	6.0	0.43
10	0 49.8	4 00 11.53	22 17 09.0	7.4	2.8	0.20	23	23 56.0	6 03 41.99	19 14 34.2	15.6	5.9	0.42
11	0 54.0	4 08 22.29	22 46 59.7	7.5	2.8	0.20	24	23 49.7	6 01 18.55	19 06 05.3	15.6	5.9	0.42
12	0 58.1	4 16 25.48	+23 14 16.0	7.6	2.9	0.20	25	23 43.6	5 59 01.00	+18 58 54.3	15.5	5.9	0.41
13	1 02.0	4 24 20.09	23 38 57.6	7.7	2.9	0.21	26	23 37.6	5 56 51.63	18 53 04.4	15.3	5.8	0.41
14	1 05.8	4 32 05.18	24 01 05.1	7.9	3.0	0.22	27	23 31.7	5 54 52.55	18 48 39.5	15.1	5.8	0.41
15	1 09.5	4 39 39.88	24 20 40.8	8.0	3.0	0.23	28	23 25.9	5 53 05.76	18 45 41.5	14.9	5.7	0.40
16	1 13.0	4 47 03.37	24 37 47.6	8.2	3.1	0.23	29	23 20.4	5 51 33.05	18 44 11.4	14.7	5.6	0.40
17	1 16.2	4 54 14.92	+24 52 29.5	8.3	3.2	0.23	30	23 15.1	5 50 16.00	+18 44 09.3	14.4	5.5	0.39
18	1 19.2	5 01 13.82	+25 04 50.3	8.5	3.2	0.24	July 1	23 10.2	5 49 15.98	+18 45 34.2	14.2	5.4	0.39

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	23 10.2	5 49 15.98	+18 45 34.2	14.2	5.4	0.39	Aug. 16	0 27.0	10 03 42.6,	+13 42 45.9	6.5	2.5	0.17
2	23 05.6	5 48 34.20	18 48 24.5	13.9	5.3	0.38	17	0 30.4	10 11 05.23	12 59 47.4	6.5	2.5	0.17
3	23 01.3	5 48 11.67	18 52 37.3	13.7	5.2	0.37	1	0 33.7	10 18 19.48	12 16 09.1	6.5	2.5	0.17
4	22 57.3	5 48 09.21	18 58 08.6	13.4	5.1	0.36	19	0 36.9	10 25 25.52	11 31 57.3	6.5	2.5	0.17
5	22 53.7	5 48 27.50	19 04 54.2	13.1	5.0	0.35	20	0 40.0	10 32 23.54	10 47 17.9	6.5	2.5	0.17
6	22 50.5	5 49 07.06	+19 12 48.5	12.8	4.9	0.35	21	0 42.9	10 39 13.77	+10 02 16.2	6.5	2.5	0.17
7	22 47.6	5 50 08.31	19 21 45.6	12.5	4.8	0.34	22	0 45.7	10 45 56.42	9 16 57.6	6.6	2.5	0.17
8	22 45.0	5 51 31.54	19 31 38.7	12.2	4.7	0.33	23	0 48.3	10 52 31.75	8 31 26.5	6.6	2.5	0.17
9	22 42.8	5 53 16.95	19 42 20.7	11.8	4.5	0.32	24	0 50.7	10 59 00.02	7 45 47.0	6.6	2.5	0.17
10	22 41.0	5 55 24.64	19 53 43.7	11.5	4.4	0.31	25	0 53.1	11 05 21.47	7 00 03.1	6.6	2.5	0.17
11	22 39.5	5 57 54.73	+20 05 39.4	11.2	4.3	0.31	26	0 55.4	11 11 36.35	+ 6 14 18.4	6.6	2.5	0.17
12	22 38.4	6 00 47.21	20 17 59.c	10.9	4.2	0.30	27	0 57.6	11 17 44.91	5 28 36.4	6.7	2.5	0.17
13	22 37.7	6 04 02.07	20 30 33.2	10.6	4.1	0.29	28	0 59.7	11 23 47.38	4 43 00.0	6.7	2.6	0.17
14	22 37.4	6 07 39.22	20 43 12.7	10.4	3.9	0.28	29	1 01.7	11 29 44.00	3 57 32.0	6.7	2.6	0.17
15	22 37.5	6 11 38.57	20 55 47.1	10.1	3.8	0.28	30	1 03.6	11 35 34.98	3 12 15.2	6.8	2.6	0.17
16	22 38.0	6 15 59.96	+21 08 05.7	9.8	3.7	0.27	31	1 05.4	11 41 20.55	+ 2 27 12.0	6.8	2.6	0.17
17	22 38.8	6 20 43.21	21 19 57.8	9.6	3.6	0.27	Sept. 1	1 07.1	11 47 00.88	1 42 25 0	6.9	2.6	0.18
18	22 39.9	6 25 48.05	21 31 12.2	9.3	3.5	0.26	2	1 08.7	11 52 36.12	0 57 56.2	6.9	2.7	0.18
19	22 41.3	6 31 14.16	21 41 37.3	9.1	3.5	0.25	3	1 10.3	11 58 06.47	+ 0 13 47.8	7.0	2.7	0.18
20	22 43.1	6 37 01.12	21 51 01.1	8.9	3.4	0.25	4	1 11.8	12 03 32.06	- 0 29 58.0	7.0	2.7	0.18
21	22 45.2	6 43 08.39	+21 59 11.6	8.7	3.3	0.24	5	1 13.2	12 08 52.95	- 1 13 19.1	7.1	2.7	0.18
22	22 47.7	6 49 35.34	22 05 56.6	8.5	3.2	0.24	6	1 14.5	12 14 09.24	1 56 13.6	7.1	2.7	0.18
23	22 50.5	6 56 21.18	22 11 04.4	8.3	3.1	0.23	7	1 15.8	12 19 21.05	2 38 39.6	7.2	2.8	0.18
24	22 53.7	7 03 25.04	22 14 23.3	8.1	3.1	0.22	8	1 17.0	12 24 28.43	3 20 34.9	7.3	2.8	0.18
25	22 57.2	7 10 45.85	22 15 41.7	7.9	3.0	0.22	9	1 18.1	12 29 31.42	4 01 57.9	7.4	2.8	0.18
26	23 00.9	7 18 22.30	+22 14 49.6	7.7	3.0	0.22	10	1 19.1	12 34 30.06	- 4 42 46.5	7.4	2.8	0.19
27	23 04.8	7 26 13.02	22 11 38.0	7.6	2.9	0.21	11	1 20.1	12 39 24.34	5 22 58.9	7.5	2.9	0.19
28	23 08.9	7 34 16.40	22 05 58.7	7.4	2.8	0.21	12	1 21.0	12 44 14.19	6 02 32.9	7.6	2.9	0.19
29	23 13.1	7 42 30.77	21 57 45.6	7.3	2.8	0.20	13	1 21.8	12 48 59.54	6 41 26.8	7.7	2.9	0.19
30	23 17.4	7 50 54.22	21 46 54.2	7.2	2.7	0.20	14	1 22.5	12 53 40.32	7 19 37.9	7.8	2.9	0.20
31	23 21.9	7 59 24.88	+21 33 22.1	7.1	2.7	0.20	15	1 23.1	12 58 16.36	- 7 57 03.8	7.9	3.0	0.20
Aug. 1	23 26.5	8 08 00.81	21 17 08.5	7.0	2.6	0.20	16	1 23.7	13 02 47.48	8 33 42.1	8.0	3.0	0.20
2	23 31.2	8 16 40.11	20 58 15.5	6.9	2.6	0.19	17	1 24.2	13 07 13.51	9 09 30.6	8.1	3.1	0.21
3	23 36.1	8 25 20.95	20 36 46.4	6.8	2.6	0.19	18	1 24.6	13 11 34.19	9 44 26.3	8.2	3.1	0.21
4	23 40.9	8 34 01.57	20 12 46.2	6.7	2.6	0.19	19	1 24.9	13 15 49.22	10 18 26.4	8.3	3.1	0.21
5	23 45.6	8 42 40.36	+19 46 21.9	6.7	2.6	0.19	20	1 25.1	13 19 58.27	- 10 51 27.6	8.4	3.2	0.22
6	23 50.2	8 51 15.94	19 17 41.1	6.7	2.6	0.19	21	1 25.2	13 24 00.93	11 23 26.7	8.5	3.2	0.22
7	23 54.7	8 59 47.02	18 46 52.6	6.6	2.5	0.18	22	1 25.2	13 27 56.73	11 54 19.6	8.6	3.3	0.23
8	23 59.2	9 08 12.52	18 14 05.9	6.6	2.5	0.18	23	1 25.1	13 31 45.13	12 24 02.5	8.8	3.3	0.23
10	0 03.6	9 16 31.63	17 39 30.5	6.6	2.5	0.18	24	1 24.9	13 35 25.53	12 52 30.6	8.9	3.3	0.23
11	0 07.8	9 24 43.60	+17 03 16.1	6.6	2.5	0.18	25	1 24.5	13 38 57.20	-13 19 39.1	9.1	3.4	0.24
12	0 11.9	9 32 47.89	16 25 32.5	6.5	2.5	0.18	26	1 23.9	13 42 19.37	13 45 22.3	9.2	3.4	0.24
13	0 15.9	9 40 44.12	15 46 28.8	6.5	2.5	0.17	27	1 23.1	13 45 31.19	14 09 34.3	9.4	3.5	0.25
14	0 19.7	9 48 32.05	15 06 14.3	6.5	2.5	0.17	28	1 22.1	13 48 31.66	14 32 08.3	9.5	3.6	0.25
15	0 23.4	9 56 11.58	14 24 57.4	6.5	2.5	0.17	29	1 20.9	13 51 19.70	14 52 56.9	9.7	3.6	0.25
16	0 27.0	10 03 42.64	+13 42 45.9	6.5	2.5	0.17	30	1 19.5	13 53 54.12	-15 11 51.9	9.9	3.7	0.26
17	0 30.4	10 11 05.23	+12 59 47.4	6.5	2.5	0.17	Oct. 1	1 17.9	13 56 13.63	-15 28 44.3	10.1	3.8	0.26

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	1 17.9	13 56 13.63	−15 28 44.3	10.1	3.8	0.26	Nov.15	22 49.2	14 28 25.47	−12 58 35.8	7.0	2.7	0.18
2	1 16.0	13 58 16.79	15 43 23.9	10.3	3.9	0.26	16	22 51.3	14 34 20.04	13 33 32.7	6.9	2.6	0.18
3	1 13.9	14 00 02.11	15 55 39.4	10.5	4.0	0.27	17	22 53.4	14 40 18.27	14 08 16.6	6.8	2.6	0.18
4	1 11.5	14 01 27.94	16 05 18.7	10.7	4.1	0.27	18	22 55.5	14 46 19.79	14 42 41.4	6.7	2.6	0.18
5	1 08.7	14 02 32.56	16 12 08.4	10.9	4.2	0.28	19	22 57.6	14 52 24.37	15 16 41.9	6.6	2.6	0.18
6	1 05.4	14 03 14.33	−16 15 54.3	11.1	4.3	0.28	20	22 59.7	14 58 31.72	−15 50 13.1	6.5	2.6	0.17
7	1 01.7	14 03 31.54	16 16 21.2	11.3	4.4	0.29	21	23 01.9	15 04 41.70	16 23 11.0	6.5	2.5	0.17
8	0 57.6	14 03 22.59	16 13 13.8	11.6	4.4	0.30	22	23 04.2	15 10 54.13	16 55 31.5	6.4	2.5	0.17
9	0 53.1	14 02 46.05	16 06 16.5	11.8	4.5	0.30	23	23 06.5	15 17 08.93	17 27 11.5	6.4	2.5	0.17
10	0 48.1	14 01 40.81	15 55 13.9	12.1	4.6	0.31	24	23 08.8	15 23 25.99	17 58 07.7	6.3	2.5	0.17
11	0 42.6	14 00 06.20	−15 39 53.4	12.3	4.7	0.32	25	23 11.1	15 29 45.23	−18 28 17.3	6.3	2.4	0.17
12	0 36.6	13 58 02.14	15 20 04.8	12.5	4.8	0.32	26	23 13.5	15 36 06.61	18 57 37.8	6.3	2.4	0.17
13	0 30.1	13 55 29.33	14 55 43.0	12.7	4.8	0.33	27	23 16.0	15 42 30.08	19 26 06.8	6.3	2.4	0.17
14	0 23.2	13 52 29.38	14 26 49.8	12.8	4.9	0.33	28	23 18.5	15 48 55.62	19 53 42.0	6.2	2.4	0.17
15	0 15.8	13 49 05.00	13 53 35.6	12.9	4.9	0.33	29	23 21.0	15 55 23.22	20 20 21.5	6.2	2.4	0.17
16	0 08.1	13 45 20.06	−13 16 21.5	13.0	5.0	0.34	30	23 23.5	16 01 52.85	−20 46 03.3	6.2	2.4	0.17
17	0 00.2	13 41 19.58	12 35 40.5	13.1	5.0	0.34	Dec. 1	23 26.1	16 08 24.51	21 10 45.4	6.2	2.3	0.17
17	23 52.2	13 37 09.60	11 52 18.2	13.2	5.0	0.34	2	23 28.7	16 14 58.15	21 34 26.3	6.2	2.3	0.17
18	23 44.1	13 32 57.10	11 07 11.8	13.1	5.0	0.34	3	23 31.4	16 21 33.82	21 57 04.1	6.2	2.3	0.17
19	23 36.0	13 28 49.44	10 21 27.0	13.0	4.9	0.33	4	23 34.1	16 28 11.46	22 18 37.4	6.2	2.3	0.17
20	23 28.2	13 24 54.18	−9 36 15.3	12.9	4.8	0.33	5	23 36.8	16 34 51.13	−22 39 04.4	6.1	2.3	0.17
21	23 20.7	13 21 18.51	8 52 49.9	12.7	4.8	0.33	6	23 39.5	16 41 32.75	22 58 23.5	6.1	2.3	0.17
22	23 13.6	13 18 08.92	8 12 18.6	12.5	4.7	0.32	7	23 42.3	16 48 16.29	23 16 33.3	6.1	2.3	0.17
23	23 07.0	13 15 30.75	7 35 42.6	12.2	4.6	0.32	8	23 45.1	16 55 01.75	23 33 32.3	6.1	2.3	0.17
24	23 01.1	13 13 28.18	7 03 51.0	11.9	4.5	0.31	9	23 47.9	17 01 49.15	23 49 19.2	6.1	2.3	0.17
25	22 55.8	13 12 03.98	−6 37 20.0	11.6	4.4	0.30	10	23 50.8	17 08 38.37	−24 03 52.3	6.1	2.3	0.17
26	22 51.1	13 11 19.51	6 16 32.7	11.2	4.3	0.29	11	23 53.7	17 15 29.43	24 17 10.1	6.1	2.3	0.17
27	22 47.1	13 11 15.01	6 01 38.8	10.9	4.1	0.28	12	23 56.6	17 22 22.25	24 29 11.6	6.1	2.3	0.17
28	22 43.7	13 11 49.61	5 52 36.4	10.6	4.0	0.28	13	23 59.6	17 29 16.76	24 39 55.2	6.1	2.3	0.17
29	22 41.0	13 13 01.58	5 49 14.8	10.3	3.9	0.27	15	0 02.6	17 36 12.92	24 49 19.4	6.1	2.3	0.17
30	22 38.8	13 14 48.66	−5 51 15.7	10.0	3.8	0.26	16	0 05.6	17 43 10.64	−24 57 22.9	6.1	2.3	0.17
31	22 37.2	13 17 08.19	5 58 15.6	9.7	3.7	0.25	17	0 08.6	17 50 09.85	25 04 04.3	6.1	2.3	0.17
Nov. 1	22 36.1	13 19 57.24	6 09 48.5	9.4	3.6	0.24	18	0 11.7	17 57 10.42	25 09 22.6	6.1	2.3	0.17
2	22 35.4	13 23 12.86	6 25 26.3	9.1	3.5	0.24	19	0 14.8	18 04 12.26	25 13 16.1	6.2	2.3	0.17
3	22 35.1	13 26 52.15	6 44 40.9	8.9	3.4	0.23	20	0 17.9	18 11 15.21	25 15 43.7	6.2	2.3	0.17
4	22 35.2	13 30 52.36	−7 07 04.4	8.6	3.3	0.22	21	0 21.0	18 18 19.13	−25 16 44.2	6.2	2.4	0.17
5	22 35.5	13 35 10.95	7 32 10.9	8.4	3.2	0.22	22	0 24.1	18 25 23.90	25 16 16.5	6.2	2.4	0.17
6	22 36.2	13 39 45.54	7 59 35.6	8.2	3.1	0.21	23	0 27.2	18 32 29.32	25 14 19.3	6.3	2.4	0.17
7	22 37.0	13 44 34.06	8 28 55.9	8.0	3.1	0.21	24	0 30.3	18 39 35.17	25 10 51.7	6.3	2.4	0.17
8	22 38.1	13 49 34.67	8 59 51.4	7.8	3.0	0.20	25	0 33.4	18 46 41.27	25 05 52.8	6.3	2.4	0.18
9	22 39.3	13 54 45.72	−9 32 03.2	7.7	2.9	0.20	26	0 36.6	18 53 47.35	−24 59 21.6	6.4	2.4	0.18
10	22 40.7	14 00 05.80	10 05 15.2	7.5	2.9	0.19	27	0 39.8	19 00 53.16	24 51 17.3	6.4	2.4	0.18
11	22 42.2	14 05 33.72	10 39 12.4	7.4	2.8	0.19	28	0 42.9	19 07 58.39	24 41 39.4	6.5	2.4	0.18
12	22 43.8	14 11 08.44	11 13 41.8	7.3	2.8	0.19	29	0 46.0	19 15 02.72	24 30 27.4	6.5	2.4	0.18
13	22 45.5	14 16 49.11	11 48 32.1	7.2	2.8	0.18	30	0 49.1	19 22 05.79	24 17 41.1	6.6	2.5	0.18
14	22 47.3	14 22 34.99	−12 23 33.2	7.1	2.7	0.18	31	0 52.2	19 29 07.19	−24 03 20.5	6.7	2.5	0.18
15	22 49.2	14 28 25.47	−12 58 35.8	7.0	2.7	0.18	32	0 55.2	19 36 06.43	−23 47 25.8	6.7	2.5	0.18

FOR TRANSIT AT WASHINGTON.

Date	Mean Time of Transit	Apparent Right Ascension	Apparent Declination	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date	Mean Time of Transit	Apparent Right Ascension	Apparent Declination	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	3 05.3	21 43 28.62	−14 01 04.8	18.5	18.0	1.23	Feb.14	23 58.4	21 37 20.79	− 5 15 55.5	32.1	31.2	2.09
1	3 03.9	21 46 02.10	13 39 00.3	18.8	18.2	1.25	15	23 52.1	21 34 56.94	5 24 21.4	32.0	31.1	2.08
2	3 02.4	21 48 30.34	13 16 57.6	19.0	18.5	1.26	16	23 45.8	21 32 36.02	5 33 27.4	31.9	31.0	2.08
3	3 00.8	21 50 53.22	12 54 58.0	19.3	18.8	1.28	17	23 39.5	21 30 18.93	5 43 08.9	31.8	30.9	2.07
4	2 59.2	21 53 10.60	12 33 03.1	19.6	19.1	1.30	18	23 33.3	21 28 06.56	5 53 21.4	31.7	30.8	2.07
5	2 57.5	21 55 22.32	−12 11 14.4	19.9	19.4	1.32	19	23 27.2	21 25 59.70	− 6 04 00.1	31.5	30.6	2.06
6	2 55.7	21 57 28.19	11 49 33.5	20.2	19.7	1.34	20	23 21.3	21 23 59.13	6 15 00.3	31.2	30.4	2.04
7	2 53.8	21 59 28.04	11 28 02.0	20.5	20.0	1.36	21	23 15.5	21 22 05.55	6 26 17.3	30.9	30.1	2.02
8	2 51.7	22 01 21.69	11 06 41.3	20.8	20.3	1.38	22	23 09.8	21 20 19.57	6 37 46.5	30.7	29.9	2.00
9	2 49.5	22 03 08.98	10 45 33.2	21.1	20.6	1.40	23	23 04.3	21 18 41.74	6 49 23.0	30.4	29.6	1.98
10	2 47.2	22 04 49.69	−10 24 39.7	21.5	20.9	1.42	24	22 58.9	21 17 12.54	− 7 01 02.5	30.1	29.3	1.96
11	2 44.8	22 06 23.63	10 04 02.5	21.8	21.2	1.44	25	22 53.6	21 15 52.36	7 12 41.3	29.7	28.9	1.94
12	2 42.3	22 07 50.59	9 43 43.5	22.2	21.6	1.46	26	22 48.5	21 14 41.54	7 24 15.7	29.4	28.6	1.92
13	2 39.7	22 09 10.38	9 23 44.5	22.5	21.9	1.48	27	22 43.6	21 13 40.33	7 35 41.8	29.0	28.2	1.89
14	2 37.0	22 10 22.79	9 04 07.6	22.9	22.3	1.50	28	22 38.8	21 12 48.89	7 46 56.3	28.7	27.9	1.87
15	2 34.2	22 11 27.54	− 8 44 54.8	23.3	22.7	1.53	Mar. 1	22 34.2	21 12 07.29	− 7 57 55.9	28.3	27.5	1.85
16	2 31.2	22 12 24.45	8 26 08.4	23.7	23.0	1.55	2	22 29.7	21 11 35.61	8 08 37.8	27.9	27.1	1.82
17	2 28.1	22 13 13.30	8 07 50.5	24.1	23.4	1.58	3	22 25.4	21 11 13.86	8 18 59.6	27.5	26.7	1.79
18	2 24.8	22 13 53.88	7 50 03.5	24.5	23.7	1.60	4	22 21.3	21 11 01.99	8 28 58.9	27.1	26.3	1.77
19	2 21.4	22 14 25.98	7 32 49.8	24.9	24.1	1.63	5	22 17.3	21 10 59.88	8 38 33.4	26.7	25.9	1.74
20	2 17.9	22 14 49.44	− 7 16 11.5	25.3	24.5	1.65	6	22 13.4	21 11 07.43	− 8 47 41.6	26.3	25.5	1.72
21	2 14.2	22 15 04.06	7 00 10.7	25.7	24.9	1.68	7	22 09.7	21 11 24.44	8 56 21.8	25.9	25.1	1.69
22	2 10.3	22 15 09.69	6 44 50.0	26.1	25.3	1.70	8	22 06.2	21 11 50.74	9 04 32.7	25.5	24.7	1.66
23	2 06.3	22 15 06.21	6 30 11.9	26.5	25.7	1.72	9	22 02.9	21 12 26.11	9 12 12.9	25.1	24.3	1.63
24	2 02.2	22 14 53.51	6 16 18.8	26.8	26.1	1.75	10	21 59.8	21 13 10.32	9 19 21.3	24.7	24.0	1.61
25	1 57.9	22 14 31.51	− 6 03 13.1	27.2	26.5	1.77	11	21 56.8	21 14 03.12	− 9 25 56.8	24.3	23.6	1.58
26	1 53.5	22 14 00.17	5 50 56.8	27.6	26.9	1.79	12	21 53.9	21 15 04.26	9 31 58.9	23.9	23.2	1.56
27	1 48.9	22 13 19.50	5 39 32.3	28.0	27.3	1.82	13	21 51.1	21 16 13.50	9 37 26.7	23.5	22.8	1.53
28	1 44.1	22 12 29.53	5 29 01.9	28.4	27.6	1.84	14	21 48.4	21 17 30.55	9 42 19.6	23.1	22.4	1.51
29	1 39.2	22 11 30.37	5 19 27.9	28.8	28.0	1.87	15	21 45.9	21 18 55.17	9 46 37.1	22.7	22.1	1.48
30	1 34.1	22 10 22.12	− 5 10 52.1	29.2	28.3	1.90	16	21 43.5	21 20 27.10	− 9 50 18.8	22.3	21.7	1.46
31	1 28.9	22 09 04.99	5 03 16.2	29.5	28.7	1.92	17	21 41.2	21 22 06.08	9 53 24.0	22.0	21.3	1.44
Feb. 1	1 23.5	22 07 39.20	4 56 42.0	29.9	29.0	1.94	18	21 39.0	21 23 51.84	9 55 52.6	21.6	21.0	1.41
2	1 18.0	22 06 05.06	4 51 10.8	30.2	29.3	1.96	19	21 36.9	21 25 44.12	9 57 44.1	21.3	20.6	1.39
3	1 12.4	22 04 22.97	4 46 44.0	30.5	29.6	1.98	20	21 35.0	21 27 42.68	9 58 58.5	21.0	20.3	1.37
4	1 06.7	22 02 33.37	− 4 43 22.6	30.8	29.9	2.00	21	21 33.2	21 29 47.28	− 9 59 35.8	20.7	20.0	1.35
5	1 00.9	22 00 36.79	4 41 06.8	31.0	30.1	2.01	22	21 31.4	21 31 57.69	9 59 35.9	20.4	19.7	1.33
6	0 55.0	21 58 33.76	4 39 56.8	31.3	30.3	2.03	23	21 29.7	21 34 13.66	9 58 58.8	20.1	19.4	1.31
7	0 48.9	21 56 24.95	4 39 52.4	31.5	30.5	2.04	24	21 28.1	21 36 34.96	9 57 44.7	19.8	19.1	1.29
8	0 42.7	21 54 11.07	4 40 53.4	31.7	30.7	2.06	25	21 26.6	21 39 01.34	9 55 53.6	19.4	18.8	1.27
9	0 36.4	21 51 52.86	4 42 58.5	31.9	30.9	2.07	26	21 25.2	21 41 32.59	− 9 53 25.6	19.1	18.5	1.25
10	0 30.0	21 49 31.10	4 46 06.1	32.0	31.0	2.07	27	21 23.9	21 44 08.48	9 50 20.9	18.8	18.2	1.23
11	0 23.6	21 47 06.69	4 50 14.1	32.1	31.1	2.08	28	21 22.6	21 46 48.81	9 46 39.8	18.5	17.9	1.21
12	0 17.3	21 44 40.53	4 55 20.0	32.1	31.2	2.09	29	21 21.4	21 49 33.33	9 42 22.6	18.2	17.6	1.19
13	0 11.0	21 42 13.54	5 01 21.0	32.2	31.3	2.09	30	21 20.3	21 52 21.87	9 37 29.6	17.9	17.4	1.17
14	0 04.7	21 39 46.64	− 5 08 14.0	32.2	31.3	2.09	31	21 19.2	21 55 14.26	− 9 32 01.2	17.6	17.2	1.16
14	23 58.4	21 37 20.79	− 5 15 55.5	32.1	31.2	2.09	Apr. 1	21 18.1	21 58 10.30	− 9 25 57.7	17.3	16.9	1.15

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	21 18.1	21 58 10.30	− 9 25 57.7	17.3	16.9	1.15	May 17	21 05.4	0 46 41.12	+ 3 06 44.8	10.1	9.8	0.66
2	21 17.1	22 01 09.78	9 19 19.7	17.0	16.7	1.13	18	21 05.5	0 50 44.16	3 29 26.5	10.0	9.7	0.65
3	21 16.2	22 04 12.56	9 12 07.5	16.8	16.4	1.12	19	21 05.6	0 54 47.94	3 52 13.7	9.9	9.7	0.65
4	21 15.5	22 07 18.46	9 04 21.6	16.6	16.2	1.10	20	21 05.7	0 58 52.48	4 15 05.5	9.8	9.6	0.64
5	21 14.8	22 10 27.31	8 56 02.6	16.3	15.9	1.09	21	21 05.8	1 02 57.78	4 38 01.3	9.7	9.5	0.63
6	21 14.1	22 13 38.94	− 8 47 10.6	16.1	15.7	1.07	22	21 06.0	1 07 03.85	+ 5 01 00.3	9.6	9.4	0.63
7	21 13.4	22 16 53.23	8 37 46.4	15.9	15.5	1.05	23	21 06.2	1 11 10.70	5 24 02.0	9.5	9.3	0.62
8	21 12.7	22 20 10.02	8 27 50.5	15.7	15.3	1.04	24	21 06.4	1 15 18.35	5 47 05.5	9.4	9.3	0.62
9	21 12.0	22 23 29.18	8 17 23.6	15.5	15.1	1.02	25	21 06.6	1 19 26.82	6 10 10.2	9.3	9.2	0.62
10	21 11.4	22 26 50.60	8 06 26.1	15.3	14.9	1.01	26	21 06.8	1 23 36.12	6 33 15.3	9.2	9.1	0.61
11	21 10.8	22 30 14.15	− 7 54 58.5	15.1	14.7	0.99	27	21 07.0	1 27 46.26	+ 6 56 20.1	9.2	9.0	0.61
12	21 10.3	22 33 39.75	7 43 01.2	14.9	14.5	0.98	28	21 07.2	1 31 57.25	7 19 24.0	9.1	8.9	0.60
13	21 09.8	22 37 07.28	7 30 35.0	14.7	14.3	0.96	29	21 07.5	1 36 09.12	7 42 26.1	9.1	8.9	0.60
14	21 09.4	22 40 36.63	7 17 40.4	14.5	14.1	0.95	30	21 07.8	1 40 21.85	8 05 25.9	9.0	8.8	0.60
15	21 09.0	22 44 07.72	7 04 17.8	14.3	13.9	0.93	31	21 08.1	1 44 35.47	8 28 22.5	8.9	8.7	0.59
16	21 08.6	22 47 40.47	− 6 50 27.9	14.1	13.7	0.92	June 1	21 08.4	1 48 50.00	+ 8 51 15.4	8.9	8.6	0.59
17	21 08.2	22 51 14.83	6 36 11.1	13.9	13.5	0.91	2	21 08.7	1 53 05.44	9 14 03.7	8.8	8.5	0.58
18	21 07.9	22 54 50.71	6 21 28.0	13.7	13.3	0.90	3	21 09.0	1 57 21.80	9 36 46.7	8.8	8.5	0.58
19	21 07.6	22 58 28.04	6 06 19.3	13.6	13.2	0.89	4	21 09.3	2 01 39.11	9 59 23.6	8.7	8.4	0.58
20	21 07.3	23 02 06.74	5 50 45.5	13.4	13.1	0.88	5	21 09.7	2 05 57.37	10 21 53.8	8.6	8.4	0.57
21	21 07.0	23 05 46.77	− 5 34 47.3	13.2	12.9	0.87	6	21 10.1	2 10 16.59	+10 44 16.4	8.6	8.3	0.57
22	21 06.7	23 09 28.08	5 18 25.3	13.1	12.8	0.86	7	21 10.5	2 14 36.80	11 06 30.8	8.5	8.3	0.56
23	21 06.5	23 13 10.59	5 01 40.1	12.9	12.6	0.85	8	21 10.9	2 18 57.99	11 28 36.2	8.5	8.2	0.56
24	21 06.3	23 16 54.26	4 44 32.3	12.8	12.5	0.84	9	21 11.3	2 23 20.19	11 50 32.1	8.4	8.2	0.56
25	21 06.1	23 20 39.05	4 27 02.7	12.7	12.3	0.83	10	21 11.7	2 27 43.43	12 12 17.7	8.4	8.1	0.55
26	21 05.9	23 24 24.91	− 4 09 11.9	12.5	12.2	0.82	11	21 12.2	2 32 07.71	+12 33 52.3	8.3	8.1	0.55
27	21 05.7	23 28 11.79	3 51 00.5	12.4	12.0	0.81	12	21 12.7	2 36 33.04	12 55 15.2	8.3	8.0	0.54
28	21 05.6	23 31 59.66	3 32 29.3	12.2	11.9	0.80	13	21 13.2	2 40 59.44	13 16 25.6	8.2	8.0	0.54
29	21 05.5	23 35 48.47	3 13 38.9	12.1	11.8	0.79	14	21 13.7	2 45 26.93	13 37 22.9	8.2	7.9	0.54
30	21 05.4	23 39 38.20	2 54 30.0	11.9	11.6	0.78	15	21 14.2	2 49 55.54	13 58 06.4	8.1	7.8	0.54
May 1	21 05.3	23 43 28.81	− 2 35 03.4	11.8	11.5	0.77	16	21 14.8	2 54 25.28	+14 18 35.3	8.1	7.8	0.53
2	21 05.2	23 47 20.27	2 15 19.7	11.7	11.4	0.76	17	21 15.4	2 58 56.17	14 38 48.9	8.0	7.7	0.53
3	21 05.2	23 51 12.55	1 55 19.7	11.6	11.3	0.75	18	21 16.0	3 03 28.21	14 58 46.7	7.9	7.7	0.53
4	21 05.1	23 55 05.62	1 35 04.0	11.5	11.2	0.75	19	21 16.6	3 08 01.42	15 18 27.7	7.9	7 7	0.53
5	21 05.1	23 58 59.47	1 14 33.4	11.3	11.0	0.74	20	21 17.2	3 12 35.80	15 37 51.3	7.8	7.6	0.53
6	21 05.0	0 02 54.07	− 0 53 48.6	11.2	10.9	0.73	21	21 17.8	3 17 11.36	+15 56 56.9	7.8	7.6	0.52
7	21 05.0	0 06 49.39	0 32 50.3	11.1	10.8	0.72	22	21 18.5	3 21 48.12	16 15 43.7	7.7	7.5	0.52
8	21 04.9	0 10 45.44	− 0 11 39.1	11.0	10.7	0.71	23	21 19.2	3 26 26.07	16 34 11.0	7.7	7.5	0.52
9	21 04.9	0 14 42.18	+ 0 09 44.1	10.9	10.6	0.71	24	21 19.9	3 31 05.24	16 52 18.0	7.6	7.4	0.52
10	21 04.9	0 18 39.62	0 31 18.7	10.8	10.5	0.70	25	21 20.6	3 35 45.62	17 10 04.1	7.6	7.4	0.52
11	21 05.0	0 22 37.75	+ 0 53 04.2	10.7	10.4	0.69	26	21 21.3	3 40 27.21	+17 27 28.8	7.5	7.3	0.51
12	21 05.0	0 26 36.57	1 14 59.7	10.6	10.3	0.69	27	21 22.1	3 45 10.00	17 44 31.1	7.5	7.3	0.51
13	21 05.1	0 30 36.09	1 37 04.6	10.5	10.2	0.68	28	21 22.9	3 49 54.00	18 01 10.6	7.5	7.3	0.51
14	21 05.1	0 34 36.29	1 59 18.3	10.4	10.1	0.68	29	21 23.7	3 54 39.21	18 17 26.4	7.5	7.2	0.51
15	21 05.2	0 38 37.19	2 21 40.0	10.3	10.0	0.67	30	21 24.5	3 59 25.61	18 33 17.6	7.4	7.2	0.51
16	21 05.3	0 42 38.80	+ 2 44 09.0	10.2	9.9	0.67	July 1	21 25.4	4 04 13.20	+18 48 43.8	7.4	7.1	0.50
17	21 05.4	0 46 41.12	+ 3 06 44.8	10.1	9.8	0.66	2	21 26.3	4 09 01.97	+19 03 44.4	7.3	7.1	0.50

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	21 25.4	4 04 13.20	+18 48 43.8	7.4	7.1	0.50	Aug. 16	22 17.8	7 58 02.74	+20 46 16.9	6.0	5.8	0.41
2	21 26.3	4 09 01.97	19 03 44.4	7.3	7.1	0.50	17	22 19.0	8 03 09.71	20 34 28.3	6.0	5.8	0.41
3	21 27.2	4 13 51.89	19 18 18.6	7.3	7.0	0.50	18	22 20.2	8 08 16.06	20 22 04.1	6.0	5.8	0.41
4	21 28.1	4 18 42.94	19 32 25.8	7.3	7.0	0.50	19	22 21.3	8 13 21.78	20 09 04.7	6.0	5.8	0.41
5	21 29.0	4 23 35.11	19 46 05.5	7.2	7.0	0.50	20	22 22.4	8 18 26.83	19 55 30.4	5.9	5.7	0.40
6	21 29.9	4 28 28.39	+19 59 16.9	7.2	6.9	0.49	21	22 23.5	8 23 31.20	+19 41 21.6	5.9	5.7	0.40
7	21 30.9	4 33 22.74	20 11 59.6	7.1	6.9	0.49	22	22 24.6	8 28 34.86	19 26 38.8	5.9	5.7	0.40
8	21 31.9	4 38 18.16	20 24 12.8	7.1	6.9	0.49	23	22 25.7	8 33 37.78	19 11 22.4	5.9	5.7	0.40
9	21 32.9	4 43 14.62	20 35 56.0	7.1	6.9	0.49	24	22 26.8	8 38 39.94	18 55 32.8	5.9	5.7	0.40
10	21 33.9	4 48 12.11	20 47 08.5	7.0	6.8	0.49	25	22 27.9	8 43 41.31	18 39 10.6	5.8	5.6	0.39
11	21 34.9	4 53 10.60	+20 57 49.8	7.0	6.8	0.48	26	22 29.0	8 48 41.89	+18 22 16.3	5.8	5.6	0.39
12	21 36.0	4 58 10.06	21 07 59.5	6.9	6.7	0.48	27	22 30.0	8 53 41.65	18 04 50.4	5.8	5.6	0.39
13	21 37.1	5 03 10.47	21 17 36.9	6.9	6.7	0.48	28	22 31.0	8 58 40.58	17 46 53.5	5.8	5.6	0.39
14	21 38.2	5 08 11.80	21 26 41.7	6.9	6.7	0.48	29	22 32.0	9 03 38.67	17 28 26.0	5.8	5.6	0.39
15	21 39.3	5 13 14.02	21 35 13.2	6.8	6.6	0.48	30	22 33.0	9 08 35.90	17 09 28.6	5.7	5.5	0.39
16	21 40.4	5 18 17.10	+21 43 11.1	6.8	6.6	0.47	31	22 34.0	9 13 32.26	+16 50 01.9	5.7	5.5	0.39
17	21 41.5	5 23 21.00	21 50 34.8	6.7	6.5	0.47	Sept. 1	22 35.0	9 18 27.75	16 30 06.3	5.7	5.5	0.39
18	21 42.6	5 28 25.69	21 57 23.9	6.7	6.5	0.47	2	22 36.0	9 23 22.35	16 09 42.7	5.7	5.5	0.39
19	21 43.7	5 33 31.14	22 03 38.1	6.7	6.5	0.47	3	22 37.0	9 28 16.07	15 48 51.6	5.7	5.5	0.39
20	21 44.8	5 38 37.30	22 09 16.9	6.7	6.5	0.47	4	22 37.9	9 23 08.91	15 27 33.6	5.6	5.5	0.38
21	21 46.0	5 43 44.13	+22 14 19.9	6.6	6.4	0.46	5	22 38.8	9 38 00.85	+15 05 49.4	5.6	5.5	0.38
22	21 47.2	5 48 51.60	22 18 46.8	6.6	6.4	0.46	6	22 39.7	9 42 51.90	14 43 39.6	5.6	5.5	0.38
23	21 48.4	5 53 59.67	22 22 37.4	6.6	6.4	0.46	7	22 40.6	9 47 42.08	14 21 04.8	5.6	5.5	0.38
24	21 49.6	5 59 08.28	22 25 51.2	6.6	6.4	0.46	8	22 41.5	9 52 31.41	13 58 05.6	5.6	5.5	0.38
25	21 50.8	6 04 17.40	22 28 28.0	6.5	6.3	0.46	9	22 42.4	9 57 19.88	13 34 42.7	5.6	5.5	0.37
26	21 52.0	6 09 26.98	+22 30 27.5	6.5	6.3	0.45	10	22 43.2	10 02 07.51	+13 10 56.8	5.6	5.4	0.37
27	21 53.2	6 14 36.97	22 31 49.5	6.4	6.2	0.45	11	22 44.0	10 06 54.31	12 46 48.6	5.6	5.4	0.37
28	21 54.5	6 19 47.31	22 32 33.8	6.4	6.2	0.45	12	22 44.8	10 11 40.31	12 22 18.7	5.6	5.4	0.37
29	21 55.7	6 24 57.95	22 32 40.3	6.4	6.2	0.45	13	22 45.6	10 16 25.51	11 57 27.8	5.6	5.4	0.37
30	21 56.9	6 30 08.84	22 32 08.8	6.3	6.2	0.45	14	22 46.4	10 21 09.93	11 32 16.5	5.5	5.4	0.36
31	21 58.1	6 35 19.94	+22 30 59.1	6.3	6.1	0.45	15	22 47.2	10 25 53.59	+11 06 45.5	5.5	5.4	0.36
Aug. 1	21 59.4	6 40 31.17	22 29 11.4	6.3	6.1	0.44	16	22 48.0	10 30 36.54	10 40 55.5	5.5	5.4	0.36
2	22 00.7	6 45 42.50	22 26 45.4	6.3	6.1	0.44	17	22 48.8	10 35 18.78	10 14 47.3	5.5	5.3	0.36
3	22 01.9	6 50 53.86	22 23 41.0	6.3	6.1	0.44	18	22 49.6	10 40 00.35	9 48 21.4	5.5	5.3	0.36
4	22 03.2	6 56 05.20	22 19 58.4	6.2	6.1	0.44	19	22 50.3	10 44 41.27	9 21 38.6	5.5	5.3	0.36
5	22 04.4	7 01 16.48	+22 15 37.6	6.2	6.0	0.44	20	22 51.0	10 49 21.57	+ 8 54 39.7	5.5	5.3	0.36
6	22 05.7	7 06 27.63	22 10 38.5	6.2	6.0	0.43	21	22 51.7	10 54 01.27	8 27 25.3	5.5	5.3	0.36
7	22 06.9	7 11 38.62	22 05 01.4	6.2	6.0	0.43	22	22 52.4	10 58 40.42	7 59 56.0	5.5	5.3	0.36
8	22 08.2	7 16 49.40	21 58 46.2	6.2	6.0	0.43	23	22 53.1	11 03 19.04	7 32 12.6	5.5	5.3	0.35
9	22 09.4	7 21 59.92	21 51 53.2	6.1	6.0	0.43	24	22 53.8	11 07 57.15	7 04 15.8	5.4	5.3	0.35
10	22 10.6	7 27 10.14	+21 44 22.4	6.1	5.9	0.43	25	22 54.5	11 12 34.80	+ 6 36 06.4	5.4	5.3	0.35
11	22 11.8	7 32 20.00	21 36 14.0	6.1	5.9	0.42	26	22 55.2	11 17 12.00	6 07 45.0	5.4	5.3	0.35
12	22 13.0	7 37 29.48	21 27 28.3	6.1	5.9	0.42	27	22 55.9	11 21 48.79	5 39 12.4	5.4	5.2	0.35
13	22 14.2	7 42 38.53	21 18 05.5	6.1	5.9	0.42	28	22 56.6	11 26 25.21	5 10 29.4	5.4	5.2	0.35
14	22 15.4	7 47 47.11	21 08 05.8	6.1	5.9	0.42	29	22 57.2	11 31 01.28	4 41 36.7	5.4	5.2	0.35
15	22 16.6	7 52 55.19	+20 57 29.5	6.0	5.8	0.42	30	22 57.9	11 35 37.04	+ 4 12 35.0	5.4	5.2	0.35
16	22 17.8	7 58 02.74	+20 46 16.9	6.0	5.8	0.41	Oct. 1	22 58.5	11 40 12.51	+ 3 43 25.1	5.4	5.2	0.35

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	22 58.5	11 40 12.51	+ 3 43 25.1	5.4	5.2	0.35	Nov.15	23 33.1	15 12 23.33	−17 09 15.8	5.2	5.0	0.35
2	22 59.2	11 44 47.74	3 14 07.6	5.4	5.2	0.35	16	23 34.2	15 17 26.07	17 31 06.4	5.1	5.0	0.35
3	22 59.8	11 49 22.77	2 44 43.3	5.4	5.2	0.35	17	23 35.3	15 22 30.04	17 52 28.9	5.1	5.0	0.35
4	23 00.5	11 53 57.63	2 15 13.0	5.3	5.2	0.34	18	23 36.4	15 27 35.25	18 13 22.5	5.1	5.0	0.35
5	23 01.1	11 58 32.35	1 45 37.3	5.3	5.2	0.34	19	23 37.6	15 32 41.69	18 33 46.5	5.1	5.0	0.35
6	23 01.7	12 03 06.98	+ 1 15 57.1	5.3	5.2	0.34	20	23 38.8	15 37 49.36	−18 53 40.1	5.1	5.0	0.35
7	23 02.3	12 07 41.56	0 46 13.0	5.3	5.2	0.34	21	23 40.0	15 42 58.28	19 13 02.5	5.1	5.0	0.35
8	23 03.0	12 12 16.11	+ 0 16 25.8	5.3	5.2	0.34	22	23 41.2	15 48 08.43	19 31 53.0	5.1	5.0	0.35
9	23 03.6	12 16 50.69	− 0 13 23.8	5.3	5.2	0.34	23	23 42.5	15 53 19.80	19 50 10.8	5.1	5.0	0.35
10	23 04.2	12 21 25.33	0 43 15.0	5.3	5.2	0.34	24	23 43.8	15 58 32.39	20 07 55.2	5.1	5.0	0.35
11	23 04.8	12 26 00.07	− 1 13 07.2	5.3	5.1	0.34	25	23 45.1	16 03 46.16	−20 25 05.4	5.1	5.0	0.35
12	23 05.4	12 30 34.95	1 42 59.5	5.3	5.1	0.34	26	23 46.4	16 09 01.11	20 41 40.7	5.1	5.0	0.36
13	23 06.1	12 35 10.02	2 12 51.3	5.3	5.1	0.34	27	23 47.7	16 14 17.21	20 57 40.5	5.1	5.0	0.36
14	23 06.7	12 39 45.33	2 42 41.7	5.3	5.1	0.34	28	23 49.0	16 19 34.43	21 13 04.1	5.1	5.0	0.36
15	23 07.4	12 44 20.90	3 12 30.1	5.3	5.1	0.34	29	23 50.4	16 24 52.75	21 27 50.8	5.1	5.0	0.36
16	23 08.0	12 48 56.78	− 3 42 15.6	5.3	5.1	0.34	30	23 51.8	16 30 12.13	−21 42 00.0	5.1	5.0	0.36
17	23 08.7	12 53 33.02	4 11 57.6	5.3	5.1	0.34	Dec. 1	23 53.2	16 35 32.55	21 55 31.1	5.1	5.0	0.36
18	23 09.3	12 58 09.65	4 41 35.4	5.2	5.1	0.34	2	23 54.6	16 40 53.97	22 08 23.4	5.1	5.0	0.36
19	23 10.0	13 02 46.73	5 11 08.2	5.2	5.1	0.34	3	23 56.0	16 46 16.34	22 20 36.3	5.1	5.0	0.36
20	23 10.7	13 07 24.28	5 40 35.0	5.2	5.1	0.34	4	23 57.4	16 51 39.63	22 32 09.3	5.1	5.0	0.36
21	23 11.4	13 12 02.35	− 6 09 55.4	5.2	5.1	0.34	5	23 58.9	16 57 03.80	−22 43 01.9	5.1	5.0	0.36
22	23 12.1	13 16 41.00	6 39 08.5	5.2	5.1	0.34	7	0 00.3	17 02 28.79	22 53 13.5	5.1	5.0	0.36
23	23 12.8	13 21 20.25	7 08 13.4	5.2	5.1	0.34	8	0 01.8	17 07 54.57	23 02 43.9	5.1	5.0	0.36
24	23 13.5	13 26 00.14	7 37 09.4	5.2	5.1	0.34	9	0 03.3	17 13 21.08	23 11 32.4	5.1	5.0	0.36
25	23 14.2	13 30 40.70	8 05 55.7	5.2	5.1	0.34	10	0 04.8	17 18 48.27	23 19 38.6	5.1		0.36
26	23 15.0	13 35 21.98	− 8 34 31.6	5.2	5.1	0.34	11	0 06.3	17 24 16.09	−23 27 02.1	5.2	5.0	0.36
27	23 15.7	13 40 04.00	9 02 56.2	5.2	5.1	0.34	12	0 07.8	17 29 44.48	23 33 42.6	5.2	5.0	0.36
28	23 16.5	13 44 46.80	9 31 08.7	5.2	5.1	0.34	13	0 09.3	17 35 13.38	23 39 39.8	5.2	5.0	0.36
29	23 17.3	13 49 30.40	9 59 08.4	5.2	5.1	0.34	14	0 10.8	17 40 42.74	23 44 53.3	5.2	5.0	0.37
30	23 18.1	13 54 14.85	10 26 54.4	5.2	5.1	0.34	15	0 12.4	17 46 12.50	23 49 22.8	5.2	5.0	0.37
31	23 18.9	13 59 00.17	−10 54 26.0	5.2	5.0	0.34	16	0 14.0	17 51 42.60	−23 53 08.0	5.2	5.0	0.37
Nov. 1	23 19.7	14 03 46.40	11 21 42.3	5.2	5.0	0.34	17	0 15.5	17 57 13.00	23 56 09.0	5.2	5.0	0.37
2	23 20.5	14 08 33.57	11 48 42.5	5.2	5.0	0.34	18	0 17.1	18 02 43.62	23 58 25.4	5.2	5.0	0.37
3	23 21.4	14 13 21.70	12 15 25.8	5.2	5.0	0.34	19	0 18.7	18 08 14.40	23 59 57.1	5.2	5.0	0.37
4	23 22.3	14 18 10.83	12 41 51.5	5.2	5.0	0.34	20	0 20.3	18 13 45.27	24 00 44.1	5.2	5.0	0.37
5	23 23.2	14 23 00.98	−13 07 58.8	5.2	5.0	0.34	21	0 21.9	18 19 16.18	−24 00 46.3	5.2	5.0	0.37
6	23 24.1	14 27 52.17	13 33 46.7	5.2	5.0	0.34	22	0 23.5	18 24 47.06	24 00 03.6	5.2	5.0	0.37
7	23 25.0	14 32 44.42	13 59 14.4	5.2	5.0	0.34	23	0 25.0	18 30 17.83	23 58 36.0	5.2	5.0	0.37
8	23 25.9	14 37 37.76	14 24 21.2	5.2	5.0	0.34	24	0 26.6	18 35 48.42	23 56 23.6	5.2	5.0	0.37
9	23 26.9	14 42 32.21	14 49 06.3	5.2	5.0	0.34	25	0 28.1	18 41 18.78	23 53 26.5	5.2	5.0	0.37
10	23 27.9	14 47 27.79	−15 13 28.9	5.2	5.0	0.34	26	0 29.7	18 46 48.85	−23 49 44.6	5.2	5.0	0.37
11	23 28.9	14 52 24.52	15 37 28.1	5.2	5.0	0.34	27	0 31.2	18 52 18.55	23 45 18.3	5.2	5.0	0.37
12	23 29.9	14 57 22.43	16 01 03.2	5.2	5.0	0.34	28	0 32.8	18 57 47.82	23 40 07.9	5.2	5.0	0.37
13	23 30.9	15 02 21.52	16 24 13.3	5.2	5.0	0.35	29	0 34.3	19 03 16.60	23 34 13.5	5.2	5.0	0.37
14	23 32.0	15 07 21.82	16 46 57.8	5.2	5.0	0.35	30	0 35.9	19 08 44.82	23 27 35.3	5.2	5.1	0.37
15	23 33.1	15 12 23.33	−17 09 15.8	5.2	5.0	0.35	31	0 37.4	19 14 12.42	−23 20 13.6	5.2	5.1	0.37
16	23 34.2	15 17 26.07	−17 31 06.4	5.1	5.0	0.35	32	0 38.9	19 19 39.35	−23 12 08.8	5.2	5.1	0.37

MARS, 1902.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Oct. 1	20 39.3	9 20 43.02	+16 51 01.9	4.3	2.5	0.17
2	20 37.8	9 23 07.98	16 40 30.7	4.3	2.5	0.17
3	20 36.3	9 25 32.39	16 29 55.0	4.3	2.5	0.17
4	20 34.8	9 27 56.27	16 19 15.1	4.3	2.5	0.17
5	20 33.2	9 30 19.62	16 08 30.9	4.3	2.5	0.17
6	20 31.6	9 32 42.45	+15 57 42.6	4.3	2.5	0.17
7	20 30.1	9 35 04.74	15 46 50.4	4.4	2.5	0.17
8	20 28.5	9 37 26.51	15 35 54.4	4.4	2.5	0.17
9	20 26.9	9 39 47.75	15 24 54.7	4.4	2.5	0.17
10	20 25.3	9 42 08.47	15 13 51.4	4.4	2.6	0.17
11	20 23.7	9 44 28.67	+15 02 44.6	4.4	2.6	0.17
12	20 22.1	9 46 48.35	14 51 34.5	4.4	2.6	0.18
13	20 20.5	9 49 07.51	14 40 21.2	4.5	2.6	0.18
14	20 18.9	9 51 26.16	14 29 04.7	4.5	2.6	0.18
15	20 17.3	9 53 44.30	14 17 45.3	4.5	2.6	0.18
16	20 15.6	9 56 01.93	+14 06 23.0	4.5	2.6	0.18
17	20 14.0	9 58 19.05	13 54 57.9	4.5	2.6	0.18
18	20 12.3	10 00 35.67	13 43 30.2	4.5	2.6	0.18
19	20 10.6	10 02 51.79	13 32 00.1	4.5	2.6	0.18
20	20 08.9	10 05 07.41	13 20 27.6	4.6	2.6	0.18
21	20 07.2	10 07 22.53	+13 08 52.8	4.6	2.6	0.18
22	20 05.5	10 09 37.13	12 57 16.0	4.6	2.6	0.18
23	20 03.8	10 11 51.23	12 45 37.2	4.6	2.7	0.18
24	20 02.1	10 14 04.83	12 33 56.6	4.6	2.7	0.18
25	20 00.4	10 16 17.92	12 22 14.3	4.7	2.7	0.18
26	19 58.7	10 18 30.49	+12 10 30.5	4.7	2.7	0.18
27	19 57.0	10 20 42.53	11 58 45.4	4.7	2.7	0.18
28	19 55.3	10 22 54.07	11 46 59.0	4.7	2.7	0.19
29	19 53.5	10 25 05.09	11 35 11.5	4.7	2.7	0.19
30	19 51.7	10 27 15.58	11 23 22.9	4.8	2.8	0.19
31	19 49.9	10 29 25.54	+11 11 33.6	4.8	2.8	0.19
Nov. 1	19 48.1	10 31 34.97	10 59 43.5	4.8	2.8	0.19
2	19 46.3	10 33 43.88	10 47 52.8	4.8	2.8	0.19
3	19 44.5	10 35 52.26	10 36 01.7	4.8	2.8	0.19
4	19 42.7	10 38 00.11	10 24 10.2	4.9	2.8	0.19
5	19 40.9	10 40 07.45	+10 12 18.5	4.9	2.8	0.19
6	19 39.1	10 42 14.24	10 00 26.7	4.9	2.8	0.19
7	19 37.3	10 44 20.50	9 48 34.8	4.9	2.8	0.19
8	19 35.5	10 46 26.23	9 36 43.1	4.9	2.8	0.19
9	19 33.6	10 48 31.43	9 24 51.6	5.0	2.9	0.19
10	19 31.7	10 50 36.11	+ 9 13 00.6	5.0	2.9	0.19
11	19 29.9	10 52 40.26	9 01 10.0	5.0	2.9	0.20
12	19 28.0	10 54 43.88	8 49 20.0	5.1	2.9	0.20
13	19 26.1	10 56 46.97	8 37 30.7	5.1	2.9	0.20
14	19 24.2	10 58 49.54	8 25 42.2	5.1	3.0	0.20
15	19 22.3	11 00 51.57	+ 8 13 54.7	5.2	3.0	0.20
16	19 20.4	11 02 53.07	+ 8 02 08.2	5.2	3.0	0.20

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Nov. 16	19 20.4	11 02 53.07	+8 02 08.2	5.2	3.0	0.20
17	19 18.5	11 04 54.04	7 50 22.9	5.2	3.0	0.20
18	19 16.6	11 06 54.47	7 38 38.9	5.2	3.0	0.20
19	19 14.6	11 08 54.36	7 26 56.4	5.3	3.0	0.20
20	19 12.6	11 10 53.70	7 15 15.6	5.3	3.0	0.20
21	19 10.7	11 12 52.49	+7 03 36.4	5.3	3.0	0.20
22	19 08.7	11 14 50.71	6 51 59.2	5.3	3.1	0.21
23	19 06.7	11 16 48.36	6 40 24.1	5.4	3.1	0.21
24	19 04.7	11 18 45.44	6 28 51.1	5.4	3.1	0.21
25	19 02.7	11 20 41.94	6 17 20.5	5.4	3.1	0.21
26	19 00.7	11 22 37.84	+6 05 52.3	5.5	3.1	0.21
27	18 58.7	11 24 33.13	5 54 26.8	5.5	3.1	0.21
28	18 56.7	11 26 27.83	5 43 04.0	5.5	3.2	0.21
29	18 54.7	11 28 21.91	5 31 44.0	5.6	3.2	0.21
30	18 52.6	11 30 15.37	5 20 27.1	5.6	3.2	0.21
Dec. 1	18 50.6	11 32 08.21	+5 09 13.3	5.6	3.2	0.22
2	18 48.5	11 34 00.40	4 58 02.7	5.6	3.3	0.22
3	18 46.4	11 35 51.96	4 46 55.6	5.7	3.3	0.22
4	18 44.3	11 37 42.87	4 35 51.9	5.7	3.3	0.22
5	18 42.2	11 39 33.12	4 24 52.0	5.7	3.3	0.22
6	18 40.1	11 41 22.71	+4 13 55.9	5.8	3.3	0.22
7	18 38.0	11 43 11.62	4 03 03.5	5.8	3.4	0.22
8	18 35.9	11 44 59.87	3 52 15.2	5.9	3.4	0.23
9	18 33.8	11 46 47.43	3 41 31.0	5.9	3.4	0.23
10	18 31.6	11 48 34.30	3 30 51.1	5.9	3.4	0.23
11	18 29.4	11 50 20.47	+3 20 15.5	6.0	3.4	0.23
12	18 27.2	11 52 05.93	3 09 44.4	6.0	3.5	0.23
13	18 25.0	11 53 50.69	2 59 18.0	6.1	3.5	0.23
14	18 22.8	11 55 34.72	2 48 56.3	6.1	3.5	0.23
15	18 20.6	11 57 18.02	2 38 39.4	6.1	3.5	0.24
16	18 18.4	11 59 00.57	+2 28 27.5	6.2	3.5	0.24
17	18 16.2	12 00 42.35	2 18 20.9	6.2	3.6	0.24
18	18 13.9	12 02 23.36	2 08 19.6	6.3	3.6	0.24
19	18 11.6	12 04 03.57	1 58 23.9	6.3	3.6	0.24
20	18 09.3	12 05 42.97	1 48 33.8	6.4	3.6	0.24
21	18 07.0	12 07 21.55	+1 38 49.6	6.4	3.7	0.24
22	18 04.7	12 08 59.28	1 29 11.3	6.4	3.7	0.25
23	18 02.4	12 10 36.14	1 19 39.2	6.5	3.7	0.25
24	18 00.1	12 12 12.12	1 10 13.4	6.5	3.7	0.25
25	17 57.7	12 13 47.19	1 00 54.0	6.6	3.8	0.25
26	17 55.3	12 15 21.33	+0 51 41.2	6.6	3.8	0.25
27	17 52.9	12 16 54.53	0 42 35.2	6.7	3.8	0.26
28	17 50.5	12 18 26.77	0 33 36.1	6.7	3.9	0.26
29	17 48.1	12 19 58.02	0 24 44.1	6.8	3.9	0.26
30	17 45.7	12 21 28.26	0 15 59.4	6.8	4.0	0.26
31	17 43.3	12 22 57.47	+0 07 22.0	6.9	4.0	0.27
32	17 40.6	12 24 25.64	−0 01 07.9	6.9	4.0	0.27

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
May 8	18 09.5	21 14 48.23	−16 34 31.0	1.8	18.9	1.40	June 22	15 15.7	21 17 55.47	−16 31 26.2	2.0	21.7	1.60
9	18 05.9	21 15 08.25	16 33 14.5	1.8	18.9	1.40	23	15 11.5	21 17 42.65	16 32 39.6	2.0	21.8	1.61
10	18 02.3	21 15 27.60	16 32 00.9	1.8	19.0	1.41	24	15 07.4	21 17 29.12	16 33 56.1	2.0	21.9	1.62
11	17 58.6	21 15 46.27	16 30 50.3	1.8	19.0	1.41	25	15 03.2	21 17 14.88	16 35 15.7	2.0	21.9	1.62
12	17 55.1	21 16 04.26	16 29 42.8	1.8	19.1	1.41	26	14 59.0	21 16 59.95	16 36 38.3	2.1	22.0	1.62
13	17 51.4	21 16 21.55	−16 28 38.3	1.8	19.2	1.42	27	14 54.8	21 16 44.34	−16 38 03.9	2.1	22.0	1.63
14	17 47.7	21 16 38.15	16 27 37.0	1.8	19.2	1.42	28	14 50.6	21 16 28.05	16 39 32.5	2.1	22.1	1.63
15	17 44.1	21 16 54.08	16 26 38.8	1.8	19.3	1.42	29	14 46.4	21 16 11.07	16 41 04.0	2.1	22.1	1.63
16	17 40.4	21 17 09.30	16 25 43.6	1.8	19.4	1.43	30	14 42.2	21 15 53.44	16 42 38.2	2.1	22.2	1.64
17	17 36.7	21 17 23.82	16 24 51.7	1.8	19.4	1.43	July 1	14 37.9	21 15 35.16	16 44 15.1	2.1	22.2	1.64
18	17 33.0	21 17 37.64	−16 24 03.0	1.8	19.5	1.44	2	14 33.7	21 15 16.24	−16 45 54.8	2.1	22.3	1.65
19	17 29.3	21 17 50.74	16 23 17.6	1.8	19.6	1.44	3	14 29.4	21 14 56.67	16 47 37.1	2.1	22.3	1.65
20	17 25.5	21 18 03.13	16 22 35.4	1.8	19.6	1.45	4	14 25.2	21 14 36.48	16 49 21.9	2.1	22.4	1.65
21	17 21.8	21 18 14.81	16 21 56.5	1.9	19.7	1.45	5	14 20.9	21 14 15.68	16 51 09.2	2.1	22.4	1.66
22	17 18.0	21 18 25.77	16 21 20.9	1.9	19.8	1.46	6	14 16.6	21 13 54.30	16 52 58.8	2.1	22.5	1.66
23	17 14.3	21 18 36.01	−16 20 48.7	1.9	19.8	1.46	7	14 12.3	21 13 32.32	−16 54 50.8	2.1	·22.5	1.67
24	17 10.5	21 18 45.51	16 20 19.8	1.9	19.9	1.47	8	14 08.0	21 13 09.77	16 56 45.0	2.1	22.6	1.67
25	17 06.7	21 18 54.28	16 19 54.3	1.9	20.0	1.47	9	14 03.7	21 12 46.68	16 58 41.4	2.1	22.6	1.67
26	17 02.9	21 19 02.32	16 19 32.2	1.9	20.1	1.48	10	13 59.3	21 12 23.06	17 00 39.7	2.1	22.7	1.68
27	16 59.1	21 19 09.63	16 19 13.5	1.9	20.1	1.48	11	13 55.0	21 11 58.91	17 02 40.0	2.1	22.7	1.68
28	16 55.3	21 19 16.19	−16 18 58.3	1.9	20.2	1.49	12	13 50.7	21 11 34.26	−17 04 42.3	2.1	22.7	1.68
29	16 51.5	21 19 22.01	16 18 46.5	1.9	20.3	1.49	13	13 46.3	21 11 09.12	17 06 46.4	2.1	22.8	1.69
30	16 47.6	21 19 27.08	16 18 38.2	1.9	20.3	1.50	14	13 42.0	21 10 43.49	17 08 52.0	2.1	22.8	1.69
31	16 43.7	21 19 31.39	16 18 33.4	1.9	20.4	1.50	15	13 37.6	21 10 17.41	17 10 59.3	2.1	22.8	1.70
June 1	16 39.9	21 19 34.95	16 18 32.2	1.9	20.4	1.51	16	13 33.2	21 09 50.88	17 13 08.2	2.1	22.9	1.70
2	16 36.0	21 19 37.76	−16 18 34.5	1.9	20.5	1.51	17	13 28.9	21 09 23.94	−17 15 18.5	2.1	22.9	1.70
3	16 32.0	21 19 39.80	16 18 40.3	1.9	20.6	1.52	18	13 24.5	21 08 56.60	17 17 30.0	2.1	22.9	1.70
4	16 28.2	21 19 41.08	16 18 49.5	1.9	20.6	1.52	19	13 20.1	21 08 28.85	17 19 42.9	2.1	22.9	1.71
5	16 24.3	21 19 41.59	16 19 02.3	1.9	20.7	1.53	20	13 15.7	21 08 00.74	17 21 56.9	2.2	23.0	1.71
6	16 20.3	21 19 41.35	16 19 18.6	1.9	20.8	1.53	21	13 11.3	21 07 32.28	17 24 12.0	2.2	23.0	1.71
7	16 16.4	21 19 40.34	−16 19 38.4	1.9	20.8	1.54	22	13 06.9	21 07 03.48	−17 26 28.1	2.2	23.0	1.71
8	16 12.4	21 19 38.58	16 20 01.0	2.0	20.9	1.54	23	13 02.4	21 06 34.37	17 28 45.1	2.2	23.0	1.72
9	16 08.4	21 19 36.05	16 20 28.6	2.0	20.9	1.55	24	12 58.0	21 06 04.96	17 31 02.8	2.2	23.0	1.72
10	16 04.5	21 19 32.78	16 20 59.0	2.0	21.0	1.55	25	12 53.6	21 05 35.27	17 33 21.2	2.2	23.1	1.72
11	16 00.5	21 19 28.76	16 21 32.7	2.0	21.1	1.55	26	12 49.2	21 05 05.32	17 35 40.1	2.2	23.1	1.72
12	15 56.4	21 19 23.96	−16 22 09.9	2.0	21.1	1.56	27	12 44.7	21 04 35.13	−17 37 59.6	2.2	23.1	1.72
13	15 52.4	21 19 18.43	16 22 50.6	2.0	21.2	1.56	28	12 40.3	21 04 04.73	17 40 19.4	2.2	23.1	1.72
14	15 48.4	21 19 12.18	16 23 34.7	2.0	21.2	1.57	29	12 35.9	21 03 34.13	17 42 39.4	2.2	23.1	1.72
15	15 44.3	21 19 05.13	16 24 22.0	2.0	21.3	1.57	30	12 31.4	21 03 03.35	17 44 59.6	2.2	23.1	1.72
16	15 40.3	21 18 57.37	16 25 12.7	2.0	21.4	1.57	31	12 27.0	21 02 32.43	17 47 19.9	2.2	23.2	1.73
17	15 36.2	21 18 48.87	−16 26 06.8	2.0	21.4	1.58	Aug. 1	12 22.5	21 02 01.39	−17 49 40.1	2.2	23.2	1.73
18	15 32.1	21 18 39.65	16 27 04.2	2.0	21.5	1.58	2	12 18.1	21 01 30.23	17 52 00.3	2.2	23.2	1.73
19	15 28.0	21 18 29.69	16 28 04.9	2.0	21.5	1.59	3	12 13.6	21 00 58.99	17 54 20.2	2.2	23.2	1.73
20	15 23.9	21 18 19.00	16 29 08.8	2.0	21.6	1.59	4	12 09.2	21 00 27.70	17 56 39.7	2.2	23.2	1.73
21	15 19.8	21 18 07.59	16 30 15.9	2.0	21.6	1.60	5	12 04.7	20 59 56.38	17 58 58.6	2.2	23.2	1.73
22	15 15.7	21 17 55.47	−16 31 26.2	2.0	21.7	1.60	6	12 00.3	20 59 25.06	−18 01 16.9	2.2	23.2	1.73
23	15 11.5	21 17 42.65	−16 32 39.6	2.0	21.8	1.61	7	11 55.8	20 58 53.74	−18 03 34.6	2.2	23.2	1.73

JUPITER, 1902.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par	Semi-diam.	Sid.T. of S D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Aug. 7	11 55.8	20 58 53.74	−18 03 34.6	2.2	23.2	1.73	Sept.22	8 37.2	20 41 09.09	−19 15 16.3	2.0	21.6	1.63
8	11 51.4	20 58 22.47	18 05 51.5	2.2	23.2	1.73	23	8 33.2	20 41 00.28	19 15 46.8	2.0	21.5	1.62
9	11 46.9	20 57 51.26	18 08 07.6	2.2	23.2	1.73	24	8 29.1	20 40 52.23	19 16 14.2	2.0	21.4	1.62
10	11 42.5	20 57 20.15	18 10 22.7	2.2	23.2	1.73	25	8 25.0	20 40 44.98	19 16 38.5	2.0	21.4	1.61
11	11 38.0	20 56 49.14	18 12 36.7	2.2	23.2	1.73	26	8 21.0	20 40 38.52	19 16 59.7	2.0	21.3	1.61
12	11 33.6	20 56 18.27	−18 14 49.6	2.2	23.2	1.73	27	8 17.0	20 40 32.86	−19 17 17.7	2.0	21.2	1.60
13	11 29.1	20 55 47.55	18 17 01.2	2.2	23.2	1.73	28	8 13.0	20 40 28.00	19 17 32.6	2.0	21.2	1.60
14	11 24.7	20 55 17.00	18 19 11.6	2.2	23.2	1.73	29	8 09.0	20 40 23.94	19 17 44.3	2.0	21.1	1.59
15	11 20.2	20 54 46.66	18 21 20.5	2.2	23.1	1.73	30	8 05.0	20 40 20.68	19 17 53.0	2.0	21.0	1.59
16	11 15.8	20 54 16.55	18 23 27.9	2.2	23.1	1.73	Oct. 1	8 01.0	20 40 18.23	19 17 58.5	2.0	21.0	1.58
17	11 11.3	20 53 46.67	−18 25 33.7	2.2	23.1	1.73	2	7 57.1	20 40 16.60	−19 18 01.0	2.0	20.9	1.58
18	11 06.9	20 53 17.06	18 27 37.9	2.2	23.1	1.73	3	7 53.1	20 40 15.78	19 18 00.3	2.0	20.8	1.57
19	11 02.5	20 52 47.72	18 29 40.5	2.2	23.1	1.73	4	7 49.2	20 40 15.78	19 17 56.4	1.9	20.8	1.57
20	10 58.1	20 52 18.69	18 31 41.3	2.2	23.0	1.73	5	7 45.2	20 40 16.59	19 17 49.4	1.9	20.7	1.56
21	10 53.7	20 51 49.99	18 33 40.2	2.2	23.0	1.73	6	7 41.3	20 40 18.21	19 17 39.2	1.9	20.7	1.56
22	10 49.3	20 51 21.63	−18 35 37.2	2.2	23.0	1.73	7	7 37.4	20 40 20.64	−19 17 25.9	1.9	20.6	1.55
23	10 44.9	20 50 53.62	18 37 32.2	2.2	23.0	1.72	8	7 33.6	20 40 23.88	19 17 09.5	1.9	20.5	1.55
24	10 40.4	20 50 25.99	18 39 25.1	2.1	22.9	1.72	9	7 29.7	20 40 27.92	19 16 50.1	1.9	20.5	1.54
25	10 36.1	20 49 58.77	18 41 15.9	2.1	22.9	1.72	10	7 25.9	20 40 32.78	19 16 27.6	1.9	20.4	1.54
26	10 31.7	20 49 31.97	18 43 04.6	2.1	22.9	1.72	11	7 22.0	20 40 38.44	19 16 02.0	1.9	20.3	1.53
27	10 27.3	20 49 05.63	−18 44 51.1	2.1	22.8	1.71	12	7 18.2	20 40 44.90	−19 15 33.3	1.9	20.2	1.53
28	10 23.0	20 48 39.73	18 46 35.2	2.1	22.8	1.71	13	7 14.4	20 40 52.16	19 15 01.6	1.9	20.2	1.52
29	10 18.6	20 48 14.32	18 48 16.9	2.1	22.8	1.71	14	7 10.6	20 41 00.22	19 14 26.9	1.9	20.1	1.52
30	10 14.3	20 47 49.40	18 49 56.2	2.1	22.7	1.71	15	7 06.8	20 41 09.06	19 13 49.1	1.9	20.1	1.51
31	10 09.9	20 47 25.00	18 51 33.0	2.1	22.7	1.71	16	7 03.0	20 41 18.68	19 13 08.3	1.9	20.0	1.51
Sept. 1	10 05.6	20 47 01.14	−18 53 07.2	2.1	22.6	1.70	17	6 59.3	20 41 29.09	−19 12 24.5	1.9	20.0	1.50
2	10 01.3	20 46 37.85	18 54 38.8	2.1	22.6	1.70	18	6 55.5	20 41 40.27	19 11 37.7	1.9	19.9	1.50
3	9 57.0	20 46 15.12	18 56 07.8	2.1	22.6	1.70	19	6 51.8	20 41 52.22	19 10 47.8	1.9	19.9	1.49
4	9 52.7	20 45 52.98	18 57 34.2	2.1	22.5	1.70	20	6 48.1	20 42 04.94	19 09 55.1	1.9	19.8	1.49
5	9 48.4	20 45 31.44	18 58 57.8	2.1	22.5	1.69	21	6 44.4	20 42 18.43	19 08 59.4	1.8	19.7	1.48
6	9 44.1	20 45 10.52	−19 00 18.6	2.1	22.4	1.69	22	6 40.7	20 42 32.68	−19 08 00.7	1.8	19.7	1.48
7	9 39.9	20 44 50.24	19 01 36.6	2.1	22.4	1.69	23	6 37.0	20 42 47.68	19 06 59.0	1.8	19.6	1.47
8	9 35.6	20 44 30.60	19 02 51.9	2.1	22.3	1.68	24	6 33.3	20 43 03.44	19 05 54.3	1.8	19.5	1.46
9	9 31.4	20 44 11.60	19 04 04.3	2.1	22.3	1.68	25	6 29.7	20 43 19.94	19 04 46.7	1.8	19.5	1.46
10	9 27.1	20 43 53.27	19 05 13.8	2.1	22.2	1.68	26	6 26.0	20 43 37.19	19 03 36.1	1.8	19.4	1.45
11	9 22.9	20 43 35.63	−19 06 20.4	2.1	22.2	1.67	27	6 23.4	20 43 55.18	−19 02 22.5	1.8	19.3	1.45
12	9 18.7	20 43 18.68	19 07 24.1	2.1	22.1	1.67	28	6 18.8	20 44 13.90	19 01 06.0	1.8	19.3	1.44
13	9 14.5	20 43 02.44	19 08 24.8	2.1	22.1	1.66	29	6 15.2	20 44 33.35	18 59 46.7	1.8	19.2	1.44
14	9 10.3	20 42 46.91	19 09 22.6	2.1	22.0	1.66	30	6 11.6	20 44 53.53	18 58 24.3	1.8	19.1	1.43
15	9 06.1	20 42 32.09	19 10 17.4	2.1	22.0	1.66	31	6 08.0	20 45 14.43	18 56 58.9	1.8	19.1	1.43
16	9 02.0	20 42 17.99	−19 11 09.2	2.1	21.9	1.65	Nov. 1	6 04.4	20 45 36.03	−18 55 30.8	1.8	19.0	1.42
17	8 57.8	20 42 04.64	19 11 58.0	2.0	21.8	1.65	2	6 00.8	20 45 58.33	18 53 59.9	1.8	18.9	1.42
18	8 53.7	20 41 52.03	19 12 43.7	2.0	21.8	1.65	3	5 57.3	20 46 21.32	18 52 26.1	1.8	18.9	1.41
19	8 49.5	20 41 40.16	19 13 26.5	2.0	21.7	1.64	4	5 53.7	20 46 45.00	18 50 49.4	1.8	18.8	1.41
20	8 45.4	20 41 29.03	19 14 06.2	2.0	21.7	1.64	5	5 50.2	20 47 09.37	18 49 09.9	1.8	18.8	1.41
21	8 41.3	20 41 18.67	−19 14 42.8	2.0	21.6	1.63	6	5 46.7	20 47 34.41	−18 47 27.5	1.8	18.7	1.40
22	8 37.2	20 41 09.09	−19 15 16.3	2.0	21.6	1.63	7	5 43.2	20 48 00.12	−18 45 42.2	1.8	18.7	1.40

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 9	18 45.8	19 56 53.65	−20 40 34.0	0.9	7.7	0.58	May 25	15 46.5	19 58 27.35	−20 39 51.1	0.9	8.3	0.63
10	18 42.0	19 57 04.64	20 40 07.9	0.9	7.7	0.59	26	15 42.4	19 58 20.09	20 40 16.8	0.9	8.3	0.63
11	18 38.3	19 57 15.24	20 39 42.9	0.9	7.7	0.59	27	15 38.4	19 58 12.45	20 40 43.5	0.9	8.3	0.64
12	18 34.5	19 57 25.46	20 39 18.9	0.9	7.7	0.59	28	15 34.3	19 58 04.44	20 41 11.2	0.9	8.4	0.64
13	18 30.7	19 57 35.30	20 38 55.9	0.9	7.8	0.59	29	15 30.2	19 57 56.07	20 41 39.9	0.9	8.4	0.64
14	18 27.0	19 57 44.74	−20 38 34.0	0.9	7.8	0.59	30	15 26.2	19 57 47.34	−20 42 09.5	0.9	8.4	0.64
15	18 23.2	19 57 53.79	20 38 13.1	0.9	7.8	0.59	31	15 22.1	19 57 38.26	20 42 40.1	0.9	8.4	0.64
16	18 19.4	19 58 02.46	20 37 53.3	0.9	7.8	0.59	June 1	15 18.0	19 57 28.82	20 43 11.6	0.9	8.4	0.64
17	18 15.6	19 58 10.73	20 37 34.6	0.9	7.8	0.59	2	15 13.9	19 57 19.03	20 43 44.2	1.0	8.4	0.64
18	18 11.8	19 58 18.61	20 37 16.9	0.9	7.9	0.60	3	15 09.8	19 57 08.89	20 44 17.7	1.0	8.4	0.64
19	18 08.0	19 58 26.09	−20 37 00.4	0.9	7.9	0.60	4	15 05.7	19 56 58.41	−20 44 52.2	1.0	8.4	0.64
20	18 04.2	19 58 33.17	20 36 45.0	0.9	7.9	0.60	5	15 01.6	19 56 47.59	20 45 27.5	1.0	8.4	0.65
21	18 00.4	19 58 39.85	20 36 30.7	0.9	7.9	0.60	6	14 57.5	19 56 36.45	20 46 03.6	1.0	8.5	0.65
22	17 56.5	19 58 46.14	20 36 17.5	0.9	7.9	0.60	7	14 53.3	19 56 24.99	20 46 40.7	1.0	8.5	0.65
23	17 52.7	19 58 52.03	20 36 05.3	0.9	7.9	0.60	8	14 49.2	19 56 13.21	20 47 18.6	1.0	8.5	0.65
24	17 48.9	19 58 57.53	−20 35 54.4	0.9	7.9	0.60	9	14 45.1	19 56 01.11	−20 47 57.3	1.0	8.5	0.65
25	17 45.0	19 59 02.63	20 35 44.7	0.9	7.9	0.60	10	14 40.9	19 55 48.71	20 48 36.7	1.0	8.5	0.65
26	17 41.1	19 59 07.32	20 35 36.1	0.9	8.0	0.60	11	14 36.8	19 55 36.01	20 49 16.9	1.0	8.5	0.65
27	17 37.3	19 59 11.61	20 35 28.7	0.9	8.0	0.61	12	14 32.7	19 55 23.01	20 49 58.0	1.0	8.5	0.65
28	17 33.4	19 59 15.49	20 35 22.3	0.9	8.0	0.61	13	14 28.5	19 55 09.73	20 50 39.8	1.0	8.5	0.65
29	17 29.6	19 59 18.96	−20 35 17.2	0.9	8.0	0.61	14	14 24.3	19 54 56.17	−20 51 22.3	1.0	8.5	0.65
30	17 25.6	19 59 22.03	20 35 13.2	0.9	8.0	0.61	15	14 20.2	19 54 42.32	20 52 05.4	1.0	8.5	0.65
May 1	17 21.8	19 59 24.69	20 35 10.5	0.9	8.0	0.61	16	14 16.0	19 54 28.20	20 52 49.3	1.0	8.5	0.65
2	17 17.9	19 59 26.94	20 35 08.8	0.9	8.0	0.61	17	14 11.8	19 54 13.82	20 53 33.8	1.0	8.5	0.65
3	17 14.0	19 59 28.78	20 35 08.3	0.9	8.0	0.62	18	14 07.7	19 53 59.19	20 54 18.8	1.0	8.6	0.65
4	17 10.1	19 59 30.21	−20 35 09.0	0.9	8.1	0.62	19	14 03.5	19 53 44.31	−20 55 04.5	1.0	8.6	0.65
5	17 06.2	19 59 31.23	20 35 10.9	0.9	8.1	0.62	20	13 59.3	19 53 29.19	20 55 50.7	1.0	8.6	0.65
6	17 02.3	19 59 31.85	20 35 14.0	0.9	8.1	0.62	21	13 55.1	19 53 13.84	20 56 37.6	1.0	8.6	0.65
7	16 58.3	19 59 32.06	20 35 18.3	0.9	8.1	0.62	22	13 50.9	19 52 58.26	20 57 25.0	1.0	8.6	0.65
8	16 54.4	19 59 31.85	20 35 23.8	0.9	8.1	0.62	23	13 46.7	19 52 42.46	20 58 12.8	1.0	8.6	0.65
9	16 50.5	19 59 31.24	−20 35 30.5	0.9	8.1	0.62	24	13 42.5	19 52 26.43	−20 59 01.0	1.0	8.6	0.65
10	16 46.5	19 59 30.22	20 35 38.4	0.9	8.1	0.62	25	13 38.3	19 52 10.20	20 59 49.7	1.0	8.6	0.65
11	16 42.5	19 59 28.79	20 35 47.3	0.9	8.1	0.63	26	13 34.1	19 51 53.78	21 00 38.9	1.0	8.6	0.65
12	16 38.6	19 59 26.96	20 35 57.3	0.9	8.2	0.63	27	13 29.9	19 51 37.16	21 01 28.5	1.0	8.6	0.65
13	16 34.6	19 59 24.73	20 36 08.6	0.9	8.2	0.63	28	13 25.7	19 51 20.35	21 02 18.4	1.0	8.6	0.66
14	16 30.6	19 59 22.10	−20 36 21.1	0.9	8.2	0.63	29	13 21.5	19 51 03.37	−21 03 08.8	1.0	8.6	0.66
15	16 26.7	19 59 19.07	20 36 34.7	0.9	8.2	0.63	30	13 17.3	19 50 46.22	21 03 59.4	1.0	8.6	0.66
16	16 22.7	19 59 15.64	20 36 49.3	0.9	8.2	0.63	July 1	13 13.0	19 50 28.91	21 04 50.4	1.0	8.6	0.66
17	16 18.7	19 59 11.82	20 37 05.1	0.9	8.2	0.63	2	13 08.8	19 50 11.46	21 05 41.7	1.0	8.6	0.66
18	16 14.7	19 59 07.61	20 37 22.1	0.9	8.2	0.63	3	13 04.6	19 49 53.86	21 06 33.2	1.0	8.6	0.66
19	16 10.7	19 59 03.01	−20 37 40.1	0.9	8.2	0.63	4	13 00.4	19 49 36.12	−21 07 24.9	1.0	8.7	0.66
20	16 06.7	19 58 58.02	20 37 59.2	0.9	8.3	0.63	5	12 56.1	19 49 18.26	21 08 16.8	1.0	8.7	0.66
21	16 02.6	19 58 52.65	20 38 19.4	0.9	8.3	0.63	6	12 51.9	19 49 00.29	21 09 09.0	1.0	8.7	0.66
22	15 58.6	19 58 46.89	20 38 40.7	0.9	8.3	0.63	7	12 47.7	19 48 42.21	21 10 01.2	1.0	8.7	0.66
23	15 54.6	19 58 40.75	20 39 03.1	0.9	8.3	0.63	8	12 43.4	19 48 24.04	21 10 53.5	1.0	8.7	0.66
24	15 50.5	19 58 34.24	−20 39 26.6	0.9	8.3	0.63	9	12 39.2	19 48 05.78	−21 11 45.9	1.0	8.7	0.66
25	15 46.5	19 58 27.35	−20 39 51.1	0.9	8.3	0.63	10	12 35.0	19 47 47.45	−21 12 38.4	1.0	8.7	0.66

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 10	12 35.0	19 47 47.45	−21 12 38.4	1.0	8.7	0.66	Aug.25	9 21.4	19 34 59.57	−21 47 25.5	1.0	8.5	0.65
11	12 30.7	19 47 29.05	21 13 30.9	1.0	8.7	0.66	26	9 17.2	19 34 47.72	21 47 56.9	1.0	8.5	0.65
12	12 26.5	19 47 10.60	21 14 23.4	1.0	8.7	0.66	27	9 13.1	19 34 36.20	21 48 27.5	1.0	8.5	0.65
13	12 22.3	19 46 52.10	21 15 15.9	1.0	8.7	0.66	28	9 09.0	19 34 25.01	21 48 57.3	1.0	8.4	0.65
14	12 18.0	19 46 33.55	21 16 08.3	1.0	8.7	0.66	29	9 04.9	19 34 14.15	21 49 26.3	0.9	8.4	0.65
15	12 13.8	19 46 14.97	−21 17 00.7	1.0	8.7	0.66	30	9 00.8	19 34 03.63	−21 49 54.4	0.9	8.4	0.65
16	12 09.5	19 45 56.38	21 17 53.0	1.0	8.7	0.66	31	8 56.7	19 33 53.46	21 50 21.6	0.9	8.4	0.65
17	12 05.3	19 45 37.78	21 18 45.2	1.0	8.7	0.66	Sept. 1	8 52.6	19 33 43.64	21 50 48.0	0.9	8.4	0.64
18	12 01.0	19 45 19.18	21 19 37.2	1.0	8.7	0.66	2	8 48.5	19 33 34.18	21 51 13.6	0.9	8.4	0.64
19	11 56.8	19 45 00.58	21 20 29.0	1.0	8.7	0.66	3	8 44.4	19 33 25.09	21 51 38.3	0.9	8.4	0.64
20	11 52.6	19 44 42.00	−21 21 20.6	1.0	8.7	0.66	4	8 40.3	19 33 16.36	−21 52 02.1	0.9	8.4	0.64
21	11 48.3	19 44 23.45	21 22 12.1	1.0	8.7	0.66	5	8 36.2	19 33 08.00	21 52 25.0	0.9	8.4	0.64
22	11 44.1	19 44 04.93	21 23 03.4	1.0	8.7	0.66	6	8 32.2	19 33 00.01	21 52 47.0	0.9	8.3	0.64
23	11 39.8	19 43 46.45	21 23 54.4	1.0	8.7	0.66	7	8 28.1	19 32 52.40	21 53 08.2	0.9	8.3	0.64
24	11 35.6	19 43 28.03	21 24 45.1	1.0	8.7	0.66	8	8 24.1	19 32 45.17	21 53 28.5	0.9	8.3	0.64
25	11 31.4	19 43 09.66	−21 25 35.5	.1.0	8.7	0.66	9	8 20.0	19 32 38.34	−21 53 47.9	0.9	8.3	0.64
26	11 27.1	19 42 51.36	21 26 25.6	1.0	8.7	0.66	10	8 16.0	19 32 31.89	21 54 06.4	0.9	8.3	0.64
27	11 22.9	19 42 33.14	21 27 15.4	1.0	8.7	0.66	11	8 12.0	19 32 25.83	21 54 24.0	0.9	8.3	0.64
28	11 18.7	19 42 15.01	21 28 04.8	1.0	8.7	0.66	12	8 07.9	19 32 20.16	21 54 40.7	0.9	8.3	0.64
29	11 14.4	19 41 56.98	21 28 53.8	1.0	8.7	0.66	13	8 03.9	19 32 14.90	21 54 56.5	0.9	8.3	0.64
30	11 10.2	19 41 39.06	−21 29 42.4	1.9	8.7	0.66	14	7 59.9	19 32 10.04	−21 55 11.4	0.9	8.2	0.64
31	11 06.0	19 41 21.24	21 30 30.6	1.0	8.7	0.66	15	7 55.9	19 32 05.58	21 55 25.3	0.9	8.2	0.64
Aug. 1	11 01.8	19 41 03.55	21 31 18.3	1.0	8.7	0.66	16	7 51.9	19 32 01.51	21 55 38.4	0.9	8.2	0.63
2	10 57.5	19 40 46.00	21 32 05.7	1.0	8.7	0.66	17	7 47.9	19 31 57.85	21 55 50.6	0.9	8.2	0.63
3	10 53.3	19 40 28.60	21 32 52.5	1.0	8.7	0.66	18	7 43.9	19 31 54.60	21 56 01.8	0.9	8.2	0.63
4	10 49.1	19 40 11.35	−21 33 38.8	1.0	8.7	0.66	19	7 39.9	19 31 51.76	−21 56 12.1	0.9	8.2	0.63
5	10 44.9	19 39 54.27	21 34 24.6	1.0	8.6	0.66	20	7 35.9	19 31 49.33	21 56 21.5	0.9	8.2	0.63
6	10 40.7	19 39 37.36	21 35 09.8	1.0	8.6	0.66	21	7 32.0	19 31 47.31	21 56 29.9	0.9	8.2	0.63
7	10 36.5	19 39 20.64	21 35 54.4	1.0	8.6	0.66	22	7 28.0	19 31 45.71	21 56 37.4	0.9	8.2	0.63
8	10 32.3	19 39 04.11	21 36 38.5	1.0	8.6	0.66	23	7 24.1	19 31 44.52	21 56 44.0	0.9	8.1	0.63
9	10 28.1	19 38 47.78	−21 37 21.9	1.0	8.6	0.66	24	7 20.1	19 31 43.75	−21 56 49.8	0.9	8.1	0.63
10	10 23.9	19 38 31.65	21 38 04.7	1.0	8.6	0.66	25	7 16.2	19 31 43.40	21 56 54.6	0.9	8.1	0.62
11	10 19.7	19 38 15.73	21 38 46.9	1.0	8.6	0.66	26	7 12.3	19 31 43.47	21 56 58.4	0.9	8.1	0.62
12	10 15.5	19 38 00.03	21 39 28.5	1.0	8.6	0.66	27	7 08.3	19 31 43.95	21 57 01.2	0.9	8.1	0.62
13	10 11.3	19 37 44.57	21 40 09.4	1.0	8.6	0.66	28	7 04.4	19 31 44.86	21 57 03.2	0.9	8.1	0.62
14	10 07.1	19 37 29.36	−21 40 49.6	1.0	8.6	0.66	29	7 00.5	19 31 46.20	−21 57 04.2	0.9	8.1	0.62
15	10 02.9	19 37 14.39	21 41 29.3	1.0	8.6	0.66	30	6 56.6	19 31 47.95	21 57 04.1	0.9	8.0	0.62
16	9 58.7	19 36 59.66	21 42 08.2	1.0	8.5	0.66	Oct. 1	6 52.7	19 31 50.12	21 57 03.2	0.9	8.0	0.62
17	9 54.6	19 36 45.20	21 42 46.4	1.0	8.5	0.66	2	6 48.8	19 31 52.72	21 57 01.4	0.9	8.0	0.62
18	9 50.4	19 36 31.00	21 43 23.9	1.0	8.5	0.66	3	6 45.0	19 31 55.76	21 56 58.6	0.9	8.0	0.61
19	9 46.2	19 36 17.07	−21 44 00.7	1.0	8.5	0.66	4	6 41.1	19 31 59.22	−21 56 54.8	0.9	8.0	0.61
20	9 42.1	19 36 03.43	21 44 36.8	1.0	8.5	0.66	5	6 37.2	19 32 03.09	21 56 50.1	0.9	8.0	0.61
21	9 37.9	19 35 50.07	21 45 12.1	1.0	8.5	0.66	6	6 33.4	19 32 07.37	21 56 44.5	0.9	8.0	0.61
22	9 33.8	19 35 36.99	21 45 46.6	1.0	8.5	0.66	7	6 29.5	19 32 12.09	21 56 37.9	0.9	8.0	0.61
23	9 29.6	19 35 24.21	21 46 20.3	1.0	8.5	0.66	8	6 25.7	19 32 17.23	21 56 30.3	0.9	7.9	0.61
24	9 25.5	19 35 11.73	−21 46 53.3	1.0	8.5	0.65	9	6 21.8	19 32 22.78	−21 56 21.8	0.9	7.9	0.61
25	9 21.4	19 34 59.57	−21 47 25.5	1.0	8.5	0.65	10	6 18.0	19 32 28.74	21 56 12.4	0.9	7.9	0.61

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Mar.12	18 01.1	17 21 41.07	−23 13 14.9	0.5	1.8	0.13	Apr. 26	15 02.7	17 20 17.09	−23 12 31.4	0.5	1.8	0.13
13	17 57.2	17 21 44.08	23 13 18.4	0.5	1.8	0.13	27	14 58.7	17 20 10.56	23 12 25.9	0.5	1.8	0.13
14	17 53.3	17 21 46.87	23 13 21.7	0.5	1.8	0.13	28	14 54.7	17 20 03.86	23 12 20.2	0.5	1.8	0.13
15	17 49.4	17 21 49.43	23 13 24.8	0.5	1.8	0.13	29	14 50.6	17 19 56.98	23 12 14.4	0.5	1.8	0.13
16	17 45.5	17 21 51.75	23 13 27.7	0.5	1.8	0.13	30	14 46.6	17 19 49.94	23 12 08.4	0.5	1.8	0.13
17	17 41.6	17 21 53.85	−23 13 30.4	0.5	1.8	0.13	May 1	14 42.5	17 19 42.74	−23 12 02.2	0.5	1.8	0.13
18	17 37.7	17 21 55.71	23 13 32.9	0.5	1.8	0.13	2	14 38.5	17 19 35.37	23 11 55.8	0.5	1.8	0.13
19	17 33.8	17 21 57.34	23 13 35.2	0.5	1.8	0.13	3	14 34.4	17 19 27.84	23 11 49.3	0.5	1.8	0.13
20	17 29.9	17 21 58.74	23 13 37.2	0.5	1.8	0.13	4	14 30.3	17 19 20.16	23 11 42.6	0.5	1.8	0.13
21	17 26.0	17 21 59.92	23 13 39.2	0.5	1.8	0.13	5	14 26.3	17 19 12.33	23 11 35.7	0.5	1.8	0.13
22	17 22.1	17 22 00.87	−23 13 40.9	0.5	1.8	0.13	6	14 22.2	17 19 04.35	−23 11 28.7	0.5	1.8	0.13
23	17 18.2	17 22 01.60	23 13 42.3	0.5	1.8	0.13	7	14 18.2	17 18 56.23	23 11 21.4	0.5	1.8	0.13
24	17 14.2	17 22 02.10	23 13 43.5	0.5	1.8	0.13	8	14 14.1	17 18 47.97	23 11 14.1	0.5	1.8	0.13
25	17 10.3	17 22 02.37	23 13 44.6	0.5	1.8	0.13	9	14 10.0	17 18 39.57	23 11 06.6	0.5	1.8	0.13
26	17 06.4	17 22 02.42	23 13 45.4	0.5	1.8	0.13	10	14 06.0	17 18 31.04	23 10 58.9	0.5	1.8	0.13
27	17 02.4	17 22 02.25	−23 13 46.0	0.5	1.8	0.13	11	14 01.9	17 18 22.38	−23 10 51.0	0.5	1.8	0.13
28	16 58.5	17 22 01.85	23 13 46.3	0.5	1.8	0.13	12	13 57.8	17 18 13.60	23 10 43.0	0.5	1.8	0.13
29	16 54.6	17 22 01.23	23 13 46.4	0.5	1.8	0.13	13	13 53.7	17 18 04.70	23 10 34.8	0.5	1.8	0.13
30	16 50.6	17 22 00.38	23 13 46.4	0.5	1.8	0.13	14	13 49.6	17 17 55.68	23 10 26.4	0.5	1.8	0.13
31	16 46.7	17 21 59.30	23 13 46.2	0.5	1.8	0.13	15	13 45.6	17 17 46.54	23 10 17.8	0.5	1.8	0.13
Apr. 1	16 42.7	17 21 58.00	−23 13 45.8	0.5	1.8	0.13	16	13 41.5	17 17 37.30	−23 10 09.1	0.5	1.8	0.13
2	16 38.8	17 21 56.48	23 13 45.2	0.5	1.8	0.13	17	13 37.4	17 17 27.96	23 10 00.3	0.5	1.8	0.13
3	16 34.8	17 21 54.74	23 13 44.4	0.5	1.8	0.13	18	13 33.3	17 17 18.52	23 09 51.3	0.5	1.8	0.13
4	16 30.8	17 21 52.78	23 13 43.4	0.5	1.8	0.13	19	13 29.2	17 17 08.97	23 09 42.2	0.5	1.8	0.13
5	16 26.9	17 21 50.60	23 13 42.2	0.5	1.8	0.13	20	13 25.1	17 16 59.33	23 09 33.0	0.5	1.8	0.13
6	16 22.9	17 21 48.19	−23 13 40.8	0.5	1.8	0.13	21	13 21.0	17 16 49.60	−23 09 23.7	0.5	1.8	0.13
7	16 18.9	17 21 45.57	23 13 39.2	0.5	1.8	0.13	22	13 16.9	17 16 39.78	23 09 14.3	0.5	1.8	0.13
8	16 14.9	17 21 42.74	23 13 37.4	0.5	1.8	0.13	23	13 12.8	17 16 29.88	23 09 04.8	0.5	1.8	0.13
9	16 10.9	17 21 39.69	23 13 35.4	0.5	1.8	0.13	24	13 08.7	17 16 19.91	23 08 55.1	0.5	1.8	0.13
10	16 07.0	17 21 36.43	23 13 33.2	0.5	1.8	0.13	25	13 04.6	17 16 09.87	23 08 45.3	0.5	1.8	0.13
11	16 03.0	17 21 32.96	−23 13 30.9	0.5	1.8	0.13	26	13 00.5	17 15 59.76	−23 08 35.3	0.5	1.8	0.13
12	15 59.0	17 21 29.28	23 13 28.4	0.5	1.8	0.13	27	12 56.4	17 15 49.58	23 08 25.2	0.5	1.8	0.13
13	15 55.0	17 21 25.39	23 13 25.7	0.5	1.8	0.13	28	12 52.3	17 15 39.34	23 08 15.0	0.5	1.8	0.13
14	15 51.0	17 21 21.30	23 13 22.7	0.5	1.8	0.13	29	12 48.2	17 15 29.04	23 08 04.7	0.5	1.8	0.13
15	15 47.0	17 21 17.01	23 13 19.4	0.5	1.8	0.13	30	12 44.1	17 15 18.69	23 07 54.3	0.5	1.8	0.13
16	15 43.0	17 21 12.52	−23 13 15.9	0.5	1.8	0.13	31	12 40.0	17 15 08.29	−23 07 43.8	0.5	1.8	0.13
17	15 39.0	17 21 07.83	23 13 12.3	0.5	1.8	0.13	June 1	12 35.9	17 14 57.84	23 07 33.3	0.5	1.8	0.13
18	15 35.0	17 21 02.94	23 13 08.5	0.5	1.8	0.13	2	12 31.8	17 14 47.35	23 07 22.7	0.5	1.8	0.13
19	15 30.9	17 20 57.86	23 13 04.5	0.5	1.8	0.13	3	12 27.7	17 14 36.83	23 07 12.0	0.5	1.8	0.13
20	15 26.9	17 20 52.59	23 13 00.3	0.5	1.8	0.13	4	12 23.6	17 14 26.28	23 07 01.2	0.5	1.8	0.13
21	15 22.9	17 20 47.13	−23 12 55.9	0.5	1.8	0.13	5	12 19.5	17 14 15.70	−23 06 50.3	0.5	1.8	0.13
22	15 18.9	17 20 41.48	23 12 51.4	0.5	1.8	0.13	6	12 15.4	17 14 05.10	23 06 39.3	0.5	1.8	0.13
23	15 14.8	17 20 35.65	23 12 46.7	0.5	1.8	0.13	7	12 11.2	17 13 54.48	23 06 28.2	0.5	1.8	0.13
24	15 10.8	17 20 29.64	23 12 41.8	0.5	1.8	0.13	8	12 07.1	17 13 43.85	23 06 17.0	0.5	1.8	0.13
25	15 06.8	17 20 23.45	23 12 36.7	0.5	1.8	0.13	9	12 03.0	17 13 33.21	23 06 05.8	0.5	1.8	0.13
26	15 02.7	17 20 17.09	−23 12 31.4	0.5	1.8	0.13	10	11 58.9	17 13 22.57	−23 05 54.6	0.5	1.8	0.13
27	14 58.7	17 20 10.56	−23 12 25.9	0.5	1.8	0.13	11	11 54.8	17 13 11.93	−23 05 43.3	0.5	1.8	0.13

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit	Apparent Right Ascension	Apparent Declination	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit	Apparent Right Ascension	Apparent Declination	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	11 19.6	5 59 11.16	+22 15 12.8	0.3	1.3	0.10	Feb.14	8 18.5	5 54 56.23	+22 16 19.2	0.3	1.3	0.09
1	11 15.6	5 59 03.97	22 15 13.6	0.3	1.3	0.10	15	8 14.5	5 54 52.95	22 16 21.4	0.3	1.3	0.09
2	11 11.5	5 58 56.81	22 15 14.5	0.3	1.3	0.10	16	8 10.5	5 54 49.80	22 16 23.6	0.3	1.3	0.09
3	11 07.5	5 58 49.69	22 15 15.4	0.3	1.3	0.10	17	8 06.5	5 54 46.78	22 16 25.8	0.3	1.3	0.09
4	11 03.4	5 58 42.60	22 15 16.3	0.3	1.3	0.10	18	8 02.5	5 54 43.90	22 16 28.1	0.3	1.3	0.09
5	10 59.4	5 58 35.55	+22 15 17.2	0.3	1.3	0.10	19	7 58.5	5 54 41.16	+22 16 30.4	0.3	1.3	0.09
6	10 55.3	5 58 28.54	22 15 18.2	0.3	1.3	0.10	20	7 54.5	5 54 38.55	22 16 32.8	0.3	1.3	0.09
7	10 51.3	5 58 21.57	22 15 19.2	0.3	1.3	0.10	21	7 50.6	5 54 36.08	22 16 35.2	0.3	1.3	0.09
8	10 47.2	5 58 14.66	22 15 20.2	0.3	1.3	0.10	22	7 46.6	5 54 33.74	22 16 37.6	0.3	1.3	0.09
9	10 43.2	5 58 07.80	22 15 21.3	0.3	1.3	0.10	23	7 42.6	5 54 31.54	22 16 40.1	0.3	1.3	0.09
10	10 39.1	5 58 00.99	+22 15 22.4	0.3	1.3	0.10	24	7 38.7	5 54 29.49	+22 16 42.6	0.3	1.3	0.09
11	10 35.1	5 57 54.24	22 15 23.5	0.3	1.3	0.10	25	7 34.7	5 54 27.58	22 16 45.1	0.3	1.3	0.09
12	10 31.0	5 57 47.55	22 15 24.7	0.3	1.3	0.10	26	7 30.7	5 54 25.81	22 16 47.7	0.3	1.3	0.09
13	10 27.0	5 57 40.92	22 15 25.9	0.3	1.3	0.10	27	7 26.8	5 54 24.18	22 16 50.3	0.3	1.3	0.09
14	10 23.0	5 57 34.36	22 15 27.1	0.3	1.3	0 10	28	7 22.8	5 54 22.68	22 16 52.9	0.3	1.3	0.09
15	10 18.9	5 57 27.87	+22 15 28.3	0.3	1.3	0.10	Mar. 1	7 18.9	5 54 21.32	+22 16 55.5	0.3	1.3	0.09
16	10 14.9	5 57 21.45	22 15 29.5	0.3	1.3	0.10	2	7 14.9	5 54 20.11	22 16 58.2	0.3	1.3	0.09
17	10 10.8	5 57 15.10	22 15 30.8	0.3	1.3	0.10	3	7 11.0	5 54 19.05	22 17 00.9	0.3	1.3	0.09
18	10 06.8	5 57 08.83	22 15 32.1	0.3	1.3	0.10	4	7 07.0	5 54 18.14	22 17 03.6	0.3	1.3	0.09
19	10 02.8	5 57 02.63	22 15 33.4	0.3	1.3	0.10	5	7 03.1	5 54 17.37	22 17 06.4	0.3	1.3	0.09
20	9 58.7	5 56 56.51	+22 15 34.7	0.3	1.3	0.10	6	6 59.1	5 54 16.75	+22 17 09.2	0.3	1.3	0.09
21	9 54.7	5 56 50.48	22 15 36.1	0.3	1.3	0.10	7	6 55.2	5 54 16.28	22 17 12.0	0.3	1.3	0.09
22	9 50.7	5 56 44.54	22 15 37.5	0.3	1.3	0.10	8	6 51.3	5 54 15.96	22 17 14.8	0.3	1.3	0.09
23	9 46.6	5 56 38.69	22 15 39.0	0.3	1.3	0.10	9	6 47.3	5 54 15.78	22 17 17.6	0.3	1.3	0.09
24	9 42.6	5 56 32.93	22 15 40.5	0.3	1.3	0.10	10	6 43.4	5 54 15.75	22 17 20.5	0.3	1.3	0.09
25	9 38.6	5 56 27.26	+22 15 42.0	0.3	1.3	0.10	11	6 39.5	5 54 15.87	+22 17 23.4	0.3	1.3	0.09
26	9 34.6	5 56 21.68	22 15 43.6	0.3	1.3	0.10	12	6 35.5	5 54 16.13	22 17 26.3	0.3	1.3	0.09
27	9 30.6	5 56 16.18	22 15 45.2	0.3	1.3	0.10	13	6 31.6	5 54 16.54	22 17 29.2	0.3	1.3	0.09
28	9 26.5	5 56 10.78	22 15 46.8	0.3	1.3	0.10	14	6 27.7	5 54 17.10	22 17 32.2	0.3	1.3	0.09
29	9 22.5	5 56 05.49	22 15 48.5	0.3	1.3	0.10	15	6 23.8	5 54 17.80	22 17 35.2	0.3	1.3	0.09
30	9 18.5	5 56 00.31	+22 15 50.2	0.3	1.3	0.10	16	6 19.9	5 54 18.65	+22 17 38.2	0.3	1.3	0.09
31	9 14.5	5 55 55.24	22 15 51.9	0.3	1.3	0.10	17	6 15.9	5 54 19.64	22 17 41.2	0.3	1.3	0.09
Feb. 1	9 10.5	5 55 50.27	22 15 53.6	0.3	1.3	0.09	18	6 12.0	5 54 20.78	22 17 44.2	0.3	1.3	0.09
2	9 06.5	5 55 45.41	22 15 55.4	0.3	1.3	0.09	19	6 08.1	5 54 22.07	22 17 47.2	0.3	1.3	0.09
3	9 02.5	5 55 40.66	22 15 57.2	0.3	1.3	0.09	20	6 04.2	5 54 23.51	22 17 50.3	0.3	1.3	0.09
4	8 58.5	5 55 36.03	+22 15 59.0	0.3	1.3	0.09	Sept.20	18 18.1	6 15 45.74	+22 17 02.2	0.3	1.3	0.09
5	8 54.4	5 55 31.50	22 16 00.9	0.3	1.3	0.09	21	18 14.2	6 15 48.02	22 16 59.6	0.3	1.3	0.09
6	8 50.4	5 55 27.09	22 16 02.8	0.3	1.3	0.09	22	18 10.3	6 15 50.16	22 16 57.1	0.3	1.3	0.09
7	8 46.4	5 55 22.80	22 16 04.7	0.3	1.3	0.09	23	18 06.4	6 15 52.15	22 16 54.6	0.3	1.3	0.09
8	8 42.4	5 55 18.63	22 16 06.7	0.3	1.3	0.09	24	18 02.5	6 15 54.00	22 16 52.1	0.3	1.3	0.09
9	8 38.4	5 55 14.58	+22 16 08.7	0.3	1.3	0.09	25	17 58.6	6 15 55.70	+22 16 49.7	0.3	1.3	0.09
10	8 34.4	5 55 10.66	22 16 10.7	0.3	1.3	0.09	26	17 54.7	6 15 57.26	22 16 47.3	0.3	1.3	0.09
11	8 30.4	5 55 06.87	22 16 12.8	0.3	1.3	0.09	27	17 50.8	6 15 58.68	22 16 45.0	0.3	1.3	0.09
12	8 26.4	5 55 03.20	22 16 14.9	0.3	1.3	0.09	28	17 46.9	6 15 59.96	22 16 42.7	0.3	1.3	0.09
13	8 22.4	5 54 59.65	22 16 17.0	0.3	1.3	0.09	29	17 43.0	6 16 01.09	22 16 40.5	0.3	1.3	0.09
14	8 18.5	5 54 56.23	+22 16 19.2	0.3	1.3	0.09	30	17 39.1	6 16 02.07	+22 16 38.3	0.3	1.3	0.09
15	8 14.5	5 54 52.95	+22 16 21.4	0.3	1.3	0.09	Oct. 1	17 35.2	6 16 02.91	+22 16 36.2	0.3	1.3	0.09

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time. of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	17 35.2	6 16 02.91	+22 16 36.2	0.3	1.3	0.09	Nov.16	14 32.5	6 14 10.95	+22 16 07.2	0.3	1.3	0.10
2	17 31.2	6 16 03.60	22 16 34.2	0.3	1.3	0.09	17	14 28.4	6 14 05.61	22 16 08.0	0.3	1.3	0.10
3	17 27.3	6 16 04.14	22 16 32.2	0.3	1.3	0.09	18	14 24.4	6 14 00.17	22 16 08.9	0.3	1.3	0.10
4	17 23.4	6 16 04.53	22 16 30.3	0.3	1.3	0.09	19	14 20.4	6 13 54.63	22 16 09.8	0.3	1.3	0.10
5	17 19.5	6 16 04.79	22 16 28.4	0.3	1.3	0.09	20	14 16.4	6 13 48.99	22 16 10.8	0.3	1.3	0.10
6	17 15.5	6 16 04.91	+22 16 26.5	0.3	1.3	0.09	21	14 12.3	6 13 43.26	+22 16 11.9	0.3	1.3	0.10
7	17 11.6	6 16 04.87	22 16 24.7	0.3	1.3	0.09	22	14 08.3	6 13 37.45	22 16 13.0	0.3	1.3	0.10
8	17 07.7	6 16 04.68	22 16 23.0	0.3	1.3	0.09	23	14 04.3	6 13 31.55	22 16 14.2	0.3	1.3	0.10
9	17 03.7	6 16 04.35	22 16 21.4	0.3	1.3	0.09	24	14 00.2	6 13 25.56	22 16 15.4	0.3	1.3	0.10
10	16 59.8	6 16 03.88	22 16 19.8	0.3	1.3	0.09	25	13 56.2	6 13 19.49	22 16 16.7	0.3	1.3	0.10
11	16 55.9	6 16 03.26	+22 16 18.3	0.3	1.3	0.09	26	13 52.2	6 13 13.33	+22 16 18.0	0.3	1.3	0.10
12	16 51.9	6 16 02.50	22 16 16.9	0.3	1.3	0.09	27	13 48.1	6 13 07.08	22 16 19.4	0.3	1.3	0.10
13	16 48.0	6 16 01.60	22 16 15.5	0.3	1.3	0.09	28	13 44.1	6 13 00.76	22 16 20.8	0.3	1.3	0.10
14	16 44.0	6 16 00.56	22 16 14.2	0.3	1.3	0.09	29	13 40.0	6 12 54.37	22 16 22.2	0.3	1.3	0.10
15	16 40.1	6 15 59.38	22 16 13.0	0.3	1.3	0.09	30	13 36.0	6 12 47.91	22 16 23.7	0.3	1.3	0.10
16	16 36.1	6 15 58.05	+22 16 11.8	0.3	1.3	0.09	Dec. 1	13 32.0	6 12 41.37	+22 16 25.2	0.3	1.3	0.10
17	16 32.2	6 15 56.58	22 16 10.7	0.3	1.3	0.09	2	13 27.9	6 12 34.78	22 16 26.8	0.3	1.3	0.10
18	16 28.2	6 15 54.97	22 16 09.6	0.3	1.3	0.09	3	13 23.9	6 12 28.13	22 16 28.4	0.3	1.3	0.10
19	16 24.2	6 15 53.22	22 16 08.6	0.3	1.3	0.09	4	13 19.8	6 12 21.40	22 16 30.1	0.3	1.3	0.10
20	16 20.3	6 15 51.33	22 16 07.7	0.3	1.3	0.09	5	13 15.8	6 12 14.61	22 16 31.8	0.3	1.3	0.10
21	16 16.3	6 15 49.30	+22 16 06.9	0.3	1.3	0.09	6	13 11.8	6 12 07.77	+22 16 33.5	0.3	1.3	0.10
22	16 12.4	6 15 47.12	22 16 06.1	0.3	1.3	0.09	7	13 07.7	6 12 00.89	22 16 35.3	0.3	1.3	0.10
23	16 08.4	6 15 44.81	22 16 05.4	0.3	1.3	0.09	8	13 03.7	6 11 53.96	22 16 37.1	0.3	1.3	0.10
24	16 04.4	6 15 42.36	22 16 04.7	0.3	1.3	0.09	9	12 59.6	6 11 46.98	22 16 39.0	0.3	1.3	0.10
25	16 00.4	6 15 39.77	22 16 04.1	0.3	1.3	0.09	10	12 55.6	6 11 39.96	22 16 40.9	0.3	1.3	0.10
26	15 56.4	6 15 37.05	+22 16 03.5	0.3	1.3	0.09	11	12 51.5	6 11 32.90	+22 16 42.8	0.3	1.3	0.10
27	15 52.5	6 15 34.20	22 16 03.0	0.3	1.3	0.09	12	12 47.5	6 11 25.80	22 16 44.8	0.3	1.3	0.10
28	15 48.5	6 15 31.22	22 16 02.6	0.3	1.3	0.09	13	12 43.4	6 11 18.66	22 16 46.8	0.3	1.3	0.10
29	15 44.5	6 15 28.11	22 16 02.3	0.3	1.3	0.09	14	12 39.4	6 11 11.49	22 16 48.8	0.3	1.3	0.10
30	15 40.5	6 15 24.86	22 16 02.0	0.3	1.3	0.09	15	12 35.3	6 11 04.30	22 16 50.8	0.3	1.3	0.10
31	15 36.5	6 15 21.47	+22 16 01.8	0.3	1.3	0.09	16	12 31.3	6 10 57.07	+22 16 52.9	0.3	1.3	0.10
Nov. 1	15 32.5	6 15 17.95	22 16 01.7	0.3	1.3	0.09	17	12 27.2	6 10 49.81	22 16 55.0	0.3	1.3	0.10
2	15 28.5	6 15 14.31	22 16 01.6	0.3	1.3	0.09	18	12 23.2	6 10 42.54	22 16 57.1	0.3	1.3	0.10
3	15 24.5	6 15 10.55	22 16 01.6	0.3	1.3	0.09	19	12 19.1	6 10 35.26	22 16 59.3	0.3	1.3	0.10
4	15 20.5	6 15 06.67	22 16 01.7	0.3	1.3	0.09	20	12 15.1	6 10 27.96	22 17 01.5	0.3	1.3	0.10
5	15 16.5	6 15 02.66	+22 16 01.9	0.3	1.3	0.09	21	12 11.0	6 10 20.64	+22 17 03.7	0.3	1.3	0 10
6	15 12.5	6 14 58.53	22 16 02.1	0.3	1.3	0.09	22	12 07.0	6 10 13.31	22 17 06.0	0.3	1.3	0.10
7	15 08.5	6 14 54.28	22 16 02.3	0.3	1.3	0.09	23	12 02.9	6 10 05.98	22 17 08.3	0.3	1.3	0.10
8	15 04.5	6 14 49.91	22 16 02.6	0.3	1.3	0.09	24	11 58.9	6 09 58.64	22 17 10.6	0.3	1.3	0.10
9	15 00.5	6 14 45.42	22 16 03.0	0.3	1.3	0.09	25	11 54.8	6 09 51.30	22 17 12.9	0.3	1.3	0.10
10	14 56.5	6 14 40.82	+22 16 03.4	0.3	1.3	0.09	26	11 50.7	6 09 43.97	+22 17 15.2	0.3	1.3	0.10
11	14 52.5	6 14 36.11	22 16 03.9	0.3	1.3	0.09	27	11 46.7	6 09 36.65	22 17 17.5	0.3	1.3	0.10
12	14 48.5	6 14 31.29	22 16 04.4	0.3	1.3	0.09	28	11 42.6	6 09 29.33	22 17 19.9	0.3	1.3	0.10
13	14 44.5	6 14 26.36	22 16 05.0	0.3	1.3	0.09	29	11 38.6	6 09 22.02	22 17 22.3	0.3	1.3	0.10
14	14 40.5	6 14 21.33	22 16 05.7	0.3	1.3	0.10	30	11 34.5	6 09 14.73	22 17 24.7	0.3	1.3	0.10
15	14 36.5	6 14 16.20	+22 16 06.4	0.3	1.3	0.10	31	11 30.5	6 09 07.46	+22 17 27.2	0.3	1.3	0.10
16	14 32.5	6 14 10.95	+22 16 07.2	0.3	1.3	0.10	32	11 26.4	6 09 00.21	+22 17 29.7	0.3	1.3	0.10

PART III

PHENOMENA

ECLIPSES IN 1902.

In the year 1902 there will be five eclipses, three of the Sun and two of the Moon.

I.—*A Partial Eclipse of the Sun*, 1902, April 8, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, April 8 02 53 26.9

Sun and Moon's R. A.	1 05 47.52	Hourly motions	9.15 and 141.19
Sun's declination	7 00 07.6 N.	Hourly motion	0 56.3 N.
Moon's declination	8 34 11.3 N.	Hourly motion	10 55.3 N.
Sun's equa. hor. parallax	8.8	Sun's true semidiameter	15 58.0
Moon's equa. hor. parallax 60 02.4		Moon's true semidiameter 16 21.7	

CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
Eclipse begins	April 8 01 30.8	124 29.1 W.	60 09.8 N.
Greatest eclipse	8 02 05.2	142 37.9 W.	71 47.1 N.
Eclipse ends	8 02 39.1	175 31.2 E.	81 30.3 N.

Magnitude of greatest eclipse = 0.065 (Sun's diameter = 1.0).

II.—*A Total Eclipse of the Moon*, 1902, April 22, invisible at Washington; the beginning visible throughout Asia and the eastern portions of Europe and Africa; the ending visible throughout Europe, Asia, and Africa.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, April 22 07 00 54.9

Sun's right ascension	1 58 09.47	Hourly motion	9.35
Moon's right ascension	13 58 09.47	Hourly motion	120.20
Sun's declination	12 04 17.2 N.	Hourly motion	0 50.6 N.
Moon's declination	12 19 25.9 S.	Hourly motion	7 51.0 S.
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 54.3
Moon's equa. hor. parallax 54 40.3		Moon's true semidiameter 14 53.9	

CIRCUMSTANCES OF THE ECLIPSE.

	d h m	
Moon enters penumbra	April 22 03 49.0	⎫
Moon enters shadow	22 05 00.1	⎪
Total eclipse begins	22 06 10.1	⎪
Middle of the eclipse	22 06 52.8	⎬ Greenwich Mean Time.
Total eclipse ends	22 07 35.5	⎪
Moon leaves shadow	22 08 45.5	⎪
Moon leaves penumbra	22 09 57.0	⎭

Contacts of shadow with Moon's limb.	Angles of position from the north point.	The Moon being in the zenith in longitude from Greenwich,	and in latitude.
First	89 to E .	103 43 E.	12 04 S.
Last	60 to W.	49 06 E.	12 33 S.

Magnitude of the eclipse = 1.338 (Moon's diameter = 1.0).

III.—*A Partial Eclipse of the Sun*, 1902, May 7, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, May 7 $\quad$ d $\quad$ h $\quad$ m $\quad$ s

May 7 $\quad$ 10 $\quad$ 12 $\quad$ 15.6

Sun and Moon's R. A.	h m s	Hourly motions 9.68 and 153.70
	2 55 42.04	
Sun's declination	16 44 50.4 N.	Hourly motion
Moon's declination	15 37 34.4 N.	Hourly motion
Sun's equa. hor. parallax	8.7	Sun's true semidiameter
Moon's equa. hor. parallax	61 02.1	Moon's true semidiameter

Sun and Moon's R. A. $\quad$ 2 55 42.04 $\qquad$ Hourly motions 9.68 and 153.70

Sun's declination $\quad$ 16 44 50.4 N. $\qquad$ Hourly motion $\quad$ 0 41.6 N.

Moon's declination $\quad$ 15 37 34.4 N. $\qquad$ Hourly motion $\quad$ 7 31.2 N.

Sun's equa. hor. parallax $\quad$ 8.7 $\qquad$ Sun's true semidiameter $\quad$ 15 50.6

Moon's equa. hor. parallax $\quad$ 61 02.1 $\qquad$ Moon's true semidiameter $\quad$ 16 38.0

CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
	d h m	° ′	° ′
Eclipse begins	May 7 08 42.5	161 53.8 E.	52 53.5 S.
Greatest eclipse	7 10 34.3	125 16.7 W.	70 00.1 S.
Eclipse ends	7 12 26.3	108 29.7 W.	32 24.7 S.

Magnitude of greatest eclipse = 0.858 (Sun's diameter = 1.0).

IV.—*A Total Eclipse of the Moon*, 1902, October 16, visible at Washington; the beginning visible generally in North and South America and the western portions of Europe and Africa; the ending visible generally in North and South America, and the extreme northeast portions of Asia.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, October 16 $\quad$ d $\quad$ h $\quad$ m $\quad$ s

October 16 $\quad$ 18 $\quad$ 10 $\quad$ 12.7

Sun's right ascension	h m s	Hourly motion	s
	13 24 52.58		9.33
Moon's right ascension	1 24 52.58	Hourly motion	138.31
Sun's declination	° ′ ″	Hourly motion	′ ″
	8 55 20.5 S.		0 55.2 S.
Moon's declination	9 08 52.7 N.	Hourly motion	10 06.4 N.
Sun's equa. hor. parallax	8.8	Sun's true semidiameter	16 03.1
Moon's equa. hor. parallax	59 13.2	Moon's true semidiameter	16 08.3

CIRCUMSTANCES OF THE ECLIPSE.

	d h m	
Moon enters penumbra	October 16 15 17.1	⎫
Moon enters shadow	16 16 17.3	⎪
Total eclipse begins	16 17 19.0	⎪
Middle of the eclipse	16 18 03.4	⎬ Greenwich Mean Time.
Total eclipse ends	16 18 47.9	⎪
Moon leaves shadow	16 19 49.7	⎪
Moon leaves penumbra	16 20 50.0	⎭

Contacts of shadow with Moon's limb.	Angles of position from the north point.	The Moon being in the zenith in longitude from Greenwich,	and in latitude.
	°	° ′	° ′
First	86 to E.	68 56 W.	8 50 N.
Last	118 to W.	120 08 W.	9 25 N.

Magnitude of the eclipse = 1.464 (Moon's diameter = 1.0).

V.—*A Partial Eclipse of the Sun*, 1902, October 30, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, October $\overset{d}{30}$ $\overset{h}{19}$ $\overset{m}{28}$ $\overset{s}{19.7}$

Sun and Moon's R. A	$\overset{h}{14}$ $\overset{m}{18}$ $\overset{s}{24.66}$	Hourly motions	$\overset{s}{9.74}$ and $\overset{s}{123.80}$
Sun's declination	$\overset{o}{13}$ $\overset{\prime}{50}$ $\overset{\prime\prime}{17.1}$ S.	Hourly motion	$\overset{\prime}{0}$ $\overset{\prime\prime}{49.2}$ S.
Moon's declination	12 44 44.8 S.	Hourly motion	7 29.9 S.
Sun's equa. hor. parallax	8.9	Sun's true semidiameter	16 06.8
Moon's equa. hor. parallax	55 18.3	Moon's true semidiameter	15 04.2

CIRCUMSTANCES OF THE ECLIPSE.
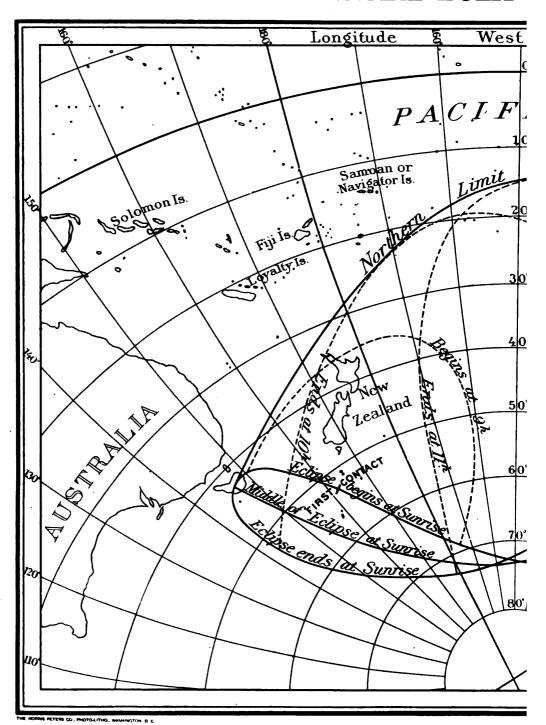
	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
	d h m	o ′	o ′
Eclipse begins October	30 17 58.6	19 51.7 E.	58 24.7 N.
Greatest eclipse	30 20 00.3	100 39.7 E.	70 50.4 N.
Eclipse ends	30 22 02.4	106 02.6 E.	33 12.6 N.

Magnitude of greatest eclipse = 0.696 (Sun's diameter = 1.0).

The regions within which the last two eclipses of the Sun are visible are laid down on the accompanying charts, from which, by means of the dotted lines, the Greenwich times of beginning and ending at any place may be found with an uncertainty which will vary from three or four minutes for a high Sun, to fifteen or twenty minutes where the Sun is near the horizon.

Longitude   West

160   180   160

PACIF

PACIFI

Samoan or
Navigator Is.

Solomon Is.

Northern   Limit

Fiji Is.

Loyalty Is.

New
Zealand

North to South

FIRST CONTACT

Eclipse begins at Sunrise

Middle of Eclipse at Sunrise

Eclipse ends at Sunrise

Begins at 9h

Ends at 11h

150   140   130   120   110

10   20   30   40   50   60   70   80

AUSTRALIA

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Note: *The hours of beginning and ending*

Greenwich

IC OCEAN

of Eclipse

Paumotu or Low Archgo.

Begins at 11h.

Begins at 10h.

Ends at 12h.

LAST CONTACT at Sunset

Eclipse ends at Sunset

Middle of Eclipse

Eclipse begins at Sunset

at Sunset

GREATEST ECLIPSE

Eclipse

S. AMERICA

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN, 1902, APRIL 8.

Greenwich Mean Time.	Co-ordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	x	y	Log sin d	Log cos d	μ	l_1
h m					° ′	
1 30	−0.757 92	+1.339 09	+9.084 48	+9.996 78	21 58.4	+0.539 59
40	0.667 11	1.366 83	9.084 64	9.996 77	24 28.5	0.539 58
50	0.576 29	1.394 56	9.084 80	9.996 77	26 58.5	0.539 56
2 00	−0.485 47	+1.422 28	+9.084 95	+9.996 77	29 28.6	+0.539 55
10	0.394 65	1.450 01	9.085 11	9.996 77	31 58.6	0.539 53
20	0.303 82	1.477 72	9.085 27	9.996 77	34 28.7	0.539 51
30	0.212 99	1.505 42	9.085 43	9.996 76	36 58.7	0.539 49
40	−0.122 16	+1.533 13	+9.085 58	+9.996 76	39 28.8	+0.539 47

Greenwich Mean Time.	Log x'	Log y'	Log μ'	Log Tangent of Angle of Cone, Penumbra.
h m				
1 00	+7.9581	+7.4431	+1.1762	+7.669 11
2 00	7.9582	7.4428	1.1762	7.669 10
3 00	+7.9582	+7.4425	+1.1762	+7.669 10

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN, 1902, MAY 7.

Greenwich Mean Time.	Co-ordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	x	y	Log sin d	Log cos d	μ	l_1
h m					° ′	
8 40	−0.875 60	−1.277 47	+9.459 25	+9.981 22	130 53.0	+0.533 12
50	0.780 71	1.258 73	9.459 30	9.981 21	133 23.0	0.533 12
9 00	−0.685 82	−1.240 00	+9.459 35	+9.981 21	135 53.1	+0.533 12
10	0.590 92	1.221 27	9.459 39	9.981 20	138 23.1	0.533 12
20	0.496 01	1.202 54	9.459 44	9.981 20	140 53.1	0.533 12
30	0.401 10	1.183 81	9.459 49	9.981 19	143 23.1	0.533 11
40	0.306 18	1.165 09	9.459 53	9.981 19	145 53.2	0.533 11
50	0.211 27	1.146 37	9.459 58	9.981 18	148 23.2	0.533 10
10 00	−0.116 36	−1.127 65	+9.459 63	+9.981 18	150 53.2	+0.533 10
10	−0.021 45	1.108 93	9.459 67	9.981 17	153 23.2	0.533 09
20	+0.073 47	1.090 21	9.459 72	9.981 17	155 53.2	0.533 09
30	0.168 38	1.071 49	9.459 77	9.981 16	158 23.3	0.533 08
40	0.263 30	1.052 78	9.459 81	9.981 16	160 53.3	0.533 07
50	0.358 21	1.034 07	9.459 86	9.981 15	163 23.3	0.533 06
11 00	+0.453 13	−1.015 36	+9.459 91	+9.981 15	165 53.3	+0.533 05
10	0.548 04	0.996 66	9.459 96	9.981 14	168 23.3	0.533 04
20	0.642 96	0.977 96	9.460 00	9.981 14	170 53.4	0.533 03
30	0.737 88	0.959 26	9.460 05	9.981 13	173 23.4	0.533 02
40	0.832 79	0.940 56	9.460 10	9.981 13	175 53.4	0.533 00
50	0.927 71	0.921 87	9.460 15	9.981 12	178 23.4	0.532 99
12 00	+1.022 63	−0.903 18	+9.460 20	+9.981 12	180 53.5	+0.532 98
10	1.117 54	0.884 50	9.460 24	9.981 11	183 23.5	0.532 96
20	1.212 46	0.865 82	9.460 29	9.981 11	185 53.5	0.532 95
30	+1.307 38	−0.847 15	+9.460 34	+9.981 10	188 23.5	+0.532 94

Greenwich Mean Time.	Log x'	Log y'	Log μ'	Log Tangent of Angle of Cone, Penumbra.
h m				
8 00	+7.9771	+7.2730	+1.1762	+7.665 71
9 00	7.9772	7.2726	1.1762	7.665 71
10 00	7.9773	7.2723	1.1762	7.665 70
11 00	7.9773	7.2720	1.1762	7.665 70
12 00	7.9773	7.2715	1.1762	7.665 69
13 00	+7.9773	+7.2709	+1.1762	+7.665 69

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN, 1902, OCTOBER 30.

Greenwich Mean Time.	Co-ordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	x	y	Log sin d	Log cos d	μ	l_1
h m					° ′	
17 50	− 0.826 37	+ 1.386 05	− 9.378 14	+ 9.987 24	271 33.6	+ 0.564 90
18 00	− 0.742 34	+ 1.365 92	− 9.378 21	+ 9.987 24	274 03.6	+ 0.564 92
10	0.658 30	1.345 79	9.378 28	9.987 24	276 33.6	0.564 95
20	0.574 26	1.325 66	9.378 35	9.987 23	279 03.7	0.564 97
30	0.490 22	1.305 54	9.378 42	9.987 23	281 33.7	0.564 99
40	0.406 18	1.285 42	9.378 49	9.987 22	284 03.7	0.565 01
50	0.322 13	1.265 30	9.378 56	9.987 22	286 33.7	0.565 03
19 00	− 0.238 08	+ 1.245 18	− 9.378 62	+ 9.987 22	289 03.7	+ 0.565 05
10	0.154 03	1.225 06	9.378 69	9.987 21	291 33.7	0.565 07
20	− 0.069 98	1.204 94	9.378 76	9.987 21	294 03.8	0.565 09
30	+ 0.014 07	1.184 83	9.378 83	9.987 20	296 33.8	0.565 11
40	0.098 11	1.164 72	9.378 90	9.987 20	299 03.8	0.565 13
50	0.182 15	1.144 61	9.378 97	9.987 19	301 33.8	0.565 15
20 00	+ 0.266 19	+ 1.124 50	− 9.379 03	+ 9.987 19	304 03.8	+ 0.565 16
10	0.350 23	1.104 39	9.379 10	9.987 18	306 33.9	0.565 18
20	0.434 26	1.084 29	9.379 17	9.987 18	309 03.9	0.565 20
30	0.518 30	1.064 19	9.379 24	9.987 18	311 33.9	0.565 21
40	0.602 33	1.044 09	9.379 31	9.987 17	314 03.9	0.565 23
50	0.686 37	1.023 99	9.379 38	9.987 17	316 33.9	0.565 24
21 00	+ 0.770 40	+ 1.003 89	− 9.379 44	+ 9.987 17	319 04.0	+ 0.565 25
10	0.854 44	0.983 80	9.379 51	9.987 16	321 34.0	0.565 27
20	0.938 47	0.963 71	9.379 58	9.987 16	324 04.0	0.565 28
30	1.022 51	0.943 63	9.379 65	9.987 16	326 34.0	0.565 29
40	1.106 54	0.923 55	9.379 72	9.987 15	329 04.0	0.565 30
50	1.190 58	0.903 47	9.379 79	9.987 15	331 34.0	0.565 31
22 00	+ 1.274 61	+ 0.883 40	− 9.379 85	+ 9.987 15	334 04.1	+ 0.565 32

Greenwich Mean Time.	Log x'	Log y'	Log μ'	Log Tangent of Angle of Cone, Penumbra.
h m				
17 00	+ 7.9244	− 7.3042	+ 1.1761	+ 7.673 15
18 00	7.9245	7.3038	1.1761	7.673 15
19 00	7.9245	7.3036	1.1761	7.673 16
20 00	7.9245	7.3034	1.1761	7.673 16
21 00	7.9244	7.3030	1.1761	7.673 17
22 00	+ 7.9244	− 7.3026	+ 1.1761	+ 7.673 17

40°

30°

80°

England

Eclipse ends at Sunrise

Middle of Eclipse at Sunrise

20°

Eclipse begins at Sunrise

70°

Begins at 18ʰ

E·U·ROPE

60°

Mediterranean Sea

10°

50°

Ends at 19ʰ

Ends at 20ʰ

40° Ends at 21ʰ

0°

A F R I C A

30° Begin

Southern

20° Limi

10°

INDI

0°

10°

20

40

Longitude

8

E

Ea

Note: *The hours of beginning and ending*

ling are expressed in Greenwich Mean Time.

WASHINGTON MEAN TIME.

PHASES OF THE MOON.

New Moon.				First Quarter.				Full Moon.				Last Quarter.			
	d	h	m		d	h	m		d	h	m		d	h	m
January	9	04	06.3	January	16	13	30.1	January	23	06	57.9	January	30	20	00.3
February	7	20	13.2	February	14	21	48.3	February	21	19	55.1	March	1	17	31.1
March	9	09	41.9	March	16	05	04.5	March	23	10	13.0	March	31	13	15.7
April	7	20	41.8	April	14	12	17.4	April	22	01	41.3	April	30	05	49.7
May	7	05	36.9	May	13	20	31.4	May	21	17	37.8	May	29	18	52.1
June	5	13	02.6	June	12	06	45.5	June	20	09	08.4	June	28	04	43.5
July	4	19	50.9	July	11	19	38.3	July	19	23	36.9	July	27	12	06.3
August	3	03	08.9	August	10	11	15.9	August	18	12	55.0	August	25	17	56.2
September	1	12	11.1	September	9	05	06.6	September	17	01	15.1	September	23	23	23.2
October	1	00	00.8	October	9	00	12.8	October	16	12	52.8	October	23	05	49.8
October	30	15	05.3	November	7	19	22.2	November	14	23	58.2	November	21	14	38.6
November	29	08	56.1	December	7	13	18.2	December	14	10	39.1	December	21	02	51.9
December	29	04	16.5												

APOGEE, PERIGEE, AND GREATEST LIBRATION.

Apogee.			Perigee.			Greatest Libration.							
	d	h		d	h		d	h	m			d	h	m
January	4	10.6	January	20	13.0	January	12	22	05 E.	January	26	06	34 W.
February	1	06.5	February	16	01.0	February	8	01	16 E.	February	22	19	02 W.
March	1	03.7	March	13	03.5	March	7	05	10 E.	March	21	06	43 W.
March	28	23.4	April	9	19.9	April	4	01	33 E.	April	16	18	20 W.
April	25	14.1	May	8	02.3	May	2	04	56 E.	May	14	10	36 W.
May	22	21.6	June	5	12.1	May	30	09	50 E.	June	11	13	34 W.
June	18	23.8	July	3	21.1	June	27	11	26 E.	July	9	18	23 W.
July	16	08.2	August	1	01.2	July	25	00	57 E.	August	6	20	23 W.
August	12	23.1	August	28	14.4	August	20	12	31 E.	September	3	14	55 W.
September	9	17.5	September	22	19.7	September	16	02	12 E.	September	30	17	50 W.
October	7	13.3	October	19	08.8	October	13	13	56 E.	October	26	23	09 W.
November	4	08.8	November	16	09.6	November	10	14	50 E.	November	22	23	49 W.
December	1	23.2	December	14	20.5	December	8	21	58 E.	December	21	00	09 W.
December	29	01.6											

FORMULÆ FOR THE LIBRATION OF THE MOON.

Let $I=$ the inclination of the Moon's equator to the ecliptic ($=1° 28.8'$),

$\Omega=$ the mean longitude of the Moon's ascending node, or the mean longitude of the descending node of the Moon's equator,

$C=$ the angle at the center of the Moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

$\lambda, \beta, a, \delta=$ the apparent longitude, latitude, right ascension, and declination of the Moon, corrected for parallax,

$\lambda'=$ the selenocentric longitude of the Earth, counted on the Moon's equator from its descending node, Ω,

$i, \Delta, \Omega', \mathbb{C}=$ the quantities defined on page 284, where their values for the current year are given.

The Moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 284 and 285:—

$$\left.\begin{array}{l} \mu = -\ 0.574' \sin 2\,(\Omega - \lambda) \\ A = \sin I \cos (\Omega - \lambda) \\ \tan B = \tan I \sin (\Omega - \lambda) \\ \lambda' = \lambda + \mu + Ab \end{array}\right\} \quad \textit{See table, page 285.}$$

The libration in latitude $= b = B - \beta$

The libration in longitude $= l = \lambda' - \mathbb{C}$

$$\sin C = \sin i\ \frac{\cos\,(\lambda' + \Delta - \Omega)}{\cos \delta} = -\sin i\ \frac{\cos\,(a - \Omega')}{\cos b}$$

MEAN PLACES FOR 1902.0.   (January 0.584^d, Washington.)

Name of Star.	Magni-tude.	Right Ascension.	Annual Proper Motion	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
51 Piscium	5.7	0 27 20.316	+ 0.0009	+ 6 24 51.18	+ 0.003
60 Piscium	6.2	0 42 19.447	− 0.0001	6 12 22.15	− 0.011
62 Piscium	6.0	0 43 12.302	+ 0.0061	6 45 53.64	− 0.002
B. A. C. 221	5.7	0 43 14.433	+ 0.0483	4 46 36.38	− 1.145
B. A. C. 274	6.2	0 54 44.813	− 0.0006	5 57 17.23	− 0.045
ε Piscium	4.5	0 57 51.354	− 0.0057	+ 7 21 45.24	+ 0.023
ζ Piscium	5.4	1 08 36.548	+ 0.0082	7 03 26.17	− 0.048
100 Piscium	6.8	1 29 39.055	− 0.0023	12 03 25.20	− 0.006
B. A. C. 490	7.5	1 32 27.832	+ 0.0091	11 34 41.14	− 0.044
54 Ceti	5.5	1 45 39.859	− 0.0054	10 33 29.35	− 0.032
B. A. C. 609	6.2	1 54 11.023	−- 0.0005	+ 11 49 09.32	− 0.063
29 Arietis	6.3	2 27 31.985	− 0.0016	14 36 02.81	+ 0.029
υ Arietis	5.8	2 39 08.813	− 0.0005	14 53 48.71	− 0.031
53 Arietis	6.3	3 01 04.499	− 0.0030	17 30 07.24	+ 0.006
B. A. C. 1119	6.4	3 33 53.161	+ 0.0033	16 13 04.78	−- 0.048
B. A. C. 1206	6.0	3 47 33.849	+ 0.0119	+ 17 02 09.24	− 0.001
B. A. C. 1240	5.7	3 55 10.000	+ 0.0097	17 55 03.87	− 0.037
B. A. C. 1272	6.3	4 02 22.643	+ 0.0018	17 04 41.05	− 0.022
ω¹ Tauri	5.8	4 03 27.323	+ 0.0068	19 21 00.98	− 0.039
W. B. (2) IV, 248	5.9	4 14 43.161	.....	18 30 28.48	....
δ¹ Tauri	4.0	4 17 16.943	+ 0.0077	+ 17 18 46.39	− 0.030
δ² Tauri	4.7	4 18 26.737	+ 0.0082	17 13 01.36	− 0.046
B. A. C. 1361	6.5	4 19 14.342	+ 0.0097	18 49 00.86	0.000
δ³ Tauri	5.0	4 19 49.083	+ 0.0073	17 42 13.93	− 0.041
B. A. C. 1468	6.3	4 40 33.445	+ 0.0043	18 33 27.23	− 0.090
B. A. C. 1563	6.5	4 59 45.399	.....	+ 19 40 19.91	....
m Tauri	5.1	5 01 39.450	+̇0.0375	18 30 49.06	+ 0.017
l Tauri	5.4	5 02 00.382	− 0.0035	20 17 21.96	− 0.034
107 Tauri	6.5	5 03 03.327	− 0.0003	19 43 58.12	− 0.007
B. A. C. 1651	6.5	5 15 09.197	.....	19 42 55.37	....
115 Tauri	5.4	5 21 27.050	+ 0.0006	+ 17 52 42.18	− 0.004
119 Tauri	4.6	5 26 28.064	+ 0.0007	18 31 17.51	− 0.006
120 Tauri	5.3	5 27 47.027	+ 0.0006	18 28 14.33	+ 0.006
B. A. C. 1733	6.3	5 27 49.204	.....	20 24 17.01	....
ζ Tauri	3.0	5 31 47.280	+ 0.0002	21 04 57.99	− 0.039
B. A. C. 1796	7.5	5 36 42.619	+ 0.0005	+ 18 56 20.64	− 0.085
127 Tauri	6.3	5 37 07.653	− 0.0020	18 55 56.69	− 0.042
130 Tauri	5.5	5 41 43.244	− 0.0013	17 41 34.32	+ 0.006
Lalande 11088	6.1	5 46 35.014	.....	19 50 34.99	....
B. A. C. 1867	7.2	5 47 29.620	+ 0.0009	20 16 30.90	− 0.094
χ¹ Orionis	4.6	5 48 34.740	− 0.0135	+ 20 15 28.60	−- 0.102
χ² Orionis	5.8	5 49 08.539	− 0.0007	19 43 50.44	− 0.014
χ³ Orionis	5.1	5 57 39.090	− 0.0054	19 41 32.50	−- 0.025
χ⁴ Orionis	4.8	5 58 05.888	− 0.0018	20 08 27.24	− 0.008
68 Orionis	5.6	6 06 13.164	+ 0.0025	+ 19 48 44.40	−- 0.026

MEAN PLACES FOR 1902.0. (January 0.584ᵈ, Washington.)					
Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
71 Orionis . . .	5.1	6 09 04.877	− 0.0081	+ 19 11 22.60	− 0.022
Lalande 12148 . .	7.0	6 17 06.9 . .	. . . .	17 37 21.43	0.000
20 Geminorum . .	6.3	6 26 34.696	+ 0.0033	17 50 55.16	+ 0.012
21 Geminorum . .	6.5	6 26 35.437	+ 0.0021	17 51 13.34	+ 0.028
22 Geminorum . .	7.2	6 28 52.228	− 0.0016	19 30 17.35	− 0.002
26 Geminorum . .	5.0	6 36 41.951	+ 0.0001	+ 17 44 27.98	− 0.101
W. B. (2), vi, 1630 .	5.9	6 56 43.528	. . . .	17 53 41.00	. . . .
51 Geminorum . .	5.4	7 07 44.611	− 0.0008	16 19 31.29	− 0.046
λ Geminorum . .	3.6	7 12 27.740	− 0.0030	16 43 01.92	− 0.052
W. 7ʰ, 685 . . .	5.6	7 26 09.4 . .	. . . .	17 17 47.9 .	. . . .
67 Geminorum . .	7.5	7 27 49.275	− 0.0044	+ 15 50 58.30	− 0.013
68 Geminorum . .	5.0	7 28 01.007	− 0.0007	16 02 14.88	− 0.026
f Geminorum . .	5.2	7 33 49.010	− 0.0011	17 53 52.66	+ 0.006
1 Cancri . . .	5.9	7 51 25.693	− 0.0021	16 03 08.10	− 0.048
B. A. C. 2649 . .	6.3	7 52 56.028	. . . .	16 46 57.82	. . . .
5 Cancri . . .	6.3	7 55 55.284	+ 0.0010	+ 16 43 31.79	− 0.016
12 Cancri . . .	6.3	8 03 13.945	+ 0.0006	13 55 34.95	− 0.018
27 Cancri . . .	5.6	8 21 18.801	− 0.0020	12 58 41.38	− 0.105
29 Cancri . . .	5.9	8 23 09.243	− 0.0021	14 32 07.06	− 0.025
A¹ Cancri . . .	5.6	8 37 48.382	− 0.0003	13 01 56.46	− 0.006
A² Cancri . . .	5.8	8 41 33.756	− 0.0055	+ 12 28 11.33	− 0.053
60 Cancri . . .	5.7	8 50 34.580	− 0.0008	12 00 02.22	− 0.018
α Cancri . . .	4.3	8 53 07.704	+ 0.0019	12 14 13.75	− 0.041
ω Leonis . . .	5.6	9 23 12.626	+ 0.0035	9 29 01.26	− 0.006
h Leonis . . .	5.4	9 26 42.510	+ 0.0006	10 08 52.98	− 0.012
10 Sextantis . . .	6.0	9 51 14.295	− 0.0070	+ 9 23 50.82	+ 0.010
11 Sextantis . . .	6.0	9 52 56.159	+ 0.0003	8 46 54.66	− 0.032
14 Sextantis . . .	6.6	10 01 39.962	− 0.0036	6 05 22.37	− 0.005
16 Sextantis . . .	6.9	10 04 06.857	+ 0.0006	6 39 04.50	− 0.013
43 Leonis . . .	6.5	10 17 52.823	− 0.0020	7 02 24.15	− 0.111
34 Sextantis . . .	6.7	10 37 33.855	− 0.0069	+ 4 05 42.13	+ 0.016
35 Sextantis (1ˢᵗ star) .	6.2	10 38 14.941	− 0.0004	5 15 37.64	− 0.067
36 Sextantis . . .	6.6	10 40 06.498	− 0.0041	3 00 12.54	− 0.016
57 Leonis . . .	6.9	10 51 09.026	+ 0.0011	0 57 20.14	− 0.022
d Leonis . . .	5.0	10 55 29.949	− 0.0006	4 08 36.68	− 0.028
ρ⁵ Leonis . . .	5.5	11 08 44.628	− 0.0026	+ 0 27 48.81	− 0.012
75 Leonis . . .	5.4	11 12 14.837	+ 0.0021	2 32 56.67	− 0.164
76 Leonis . . .	6.3	11 13 53.108	− 0.0045	2 11 15.29	− 0.066
79 Leonis . . .	5.5	11 19 00.569	− 0.0025	+ 1 56 43.29	− 0.012
B. A. C. 4134 . .	6.0	12 13 07.6 . .	. . . .	− 3 24 34.0 .	. . . .
B. A. C. 4200 . .	5.7	12 22 49.929	. . . .	− 4 04 23.15	. . . .
B. A. C. 4225 . .	6.3	12 26 36.380	. . . .	4 30 44.59	. . . .
f Virginis . .	5.9	12 31 44.418	− 0.0030	5 17 31.71	− 0.042
χ Virginis . .	4.7	12 34 11.207	− 0.0058	7 27 23.65	− 0.043
28 Virginis . .	7.0	12 36 53.550	+ 0.0003	6 57 40.65	− 0.004

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	
B. A. C. 4294 .	6.1	12 42 29.456	....	− 5 45 54.46	....
ψ Virginis . .	5.2	12 49 15.291	− 0.0026	9 00 25.13	− 0.034
B. A. C. 4394 .	5.9	13 03 25.9 ..	....	8 27 32.27	− 0.034
50 Virginis . .	6.3	13 04 37.523	− 0.0007	9 48 23.80	− 0.013
56 Virginis . .	7.0	13 09 36.818	− 0.0026	9 51 02.08	− 0.062
58 Virginis . .	7.0	13 12 19.132	− 0.0055	− 10 01 47.62	+ 0.013
62 Virginis . .	7.0	13 15 11.050	− 0.0100	10 47 22.28	− 0.020
h Virginis . .	5.5	13 27 48.239	− 0.0036	9 39 36.56	− 0.039
86 Virginis . .	6.0	13 40 42.881	− 0.0023	11 56 08.39	− 0.001
B. A. C. 4591 .	6.3	13 42 02.542	....	9 13 06.51	....
5 Libræ . .	6.6	14 40 33.500	− 0.0024	− 15 02 47.99	− 0.009
μ Libræ . .	5.4	14 43 56.614	− 0.0058	13 44 27.58	− 0.032
υ¹ Libræ . .	5.3	14 45 15.775	− 0.0093	15 35 24.17	− 0.081
ν¹ Libræ . .	5.4	15 01 09.501	− 0.0043	15 52 38.12	− 0.046
ν² Libræ . .	6.9	15 01 20.658	− 0.0064	16 06 18.44	− 0.029
26 Libræ . .	6.5	15 09 01.873	− 0.0022	− 17 24 10.21	− 0.027
28 Libræ . .	6.0	15 15 20.217	− 0.0013	17 48 11.94	− 0.089
υ¹ Libræ . .	6.0	15 15 32.601	+ 0.0019	15 11 41.99	+ 0.024
υ² Libræ . .	7.0	15 17 33.705	− 0.0010	14 47 04.46	− 0.001
ζ¹ Libræ . .	5.7	15 22 43.675	+ 0.0001	16 22 30.32	− 0.051
ζ² Libræ . .	7.0	15 24 01.973	− 0.0065	− 17 06 10.44	−· 0.001
ζ³ Libræ . .	6.0	15 25 08.604	+ 0.0010	16 16 24.97	− 0.020
ζ⁴ Libræ . .	5.8	15 27 22.893	−· 0.0019	16 31 15.19	·− 0.034
41 Libræ . .	5.7	15 33 15.960	+ 0.0062	18 58 45.23	− 0.074
λ Libræ . .	5.0	15 47 38.564	−· 0.0023	19 52 27.79	− 0.036
θ Libræ . .	4.3	15 48 14.633	+ 0.0059	− 16 26 31.10	− 0.117
47 Libræ . .	6.4	15 49 20.366	− 0.0025	19 05 37.42	− 0.034
49 Libræ . .	5.6	15 54 49.581	− 0.0433	16 14 41.42	− 0.393
ν Scorpii . .	4.2	16 06 17.843	− 0.0023	19 12 22.87	− 0.042
ψ Ophiuchi . .	4.6	16 18 22.070	− 0.0016	19 48 30.51	− 0.075
χ Ophiuchi . .	5.0	16 21 20.517	− 0.0019	− 18 14 03.86	− 0.043
24 Scorpii . .	5.5	16 35 54.317	− 0.0013	17 33 11.07	− 0.018
B. A. C. 5580 .	5.7	16 36 07.963	− 0.0002	19 44 13.14	+ 0.028
29 Ophiuchi . .	6.8	16 56 07.168	− 0.0048	18 44 29.21	− 0.012
B. A. C. 6060 .	6.5	17 50 09.1 ..	....	18 47 02.5 .	....
B. A. C. 6081 .	6.5	17 54 10.285	....	−· 20 19 56.88	....
16 Sagittarii .	6.2	18 09 23.104	− 0.0010	20 25 03.19	− 0.025
B. A. C. 6287 .	5.7	18 24 25.9 ..	....	18 47 28.20	− 0.096
B. A. C. 6294 .	5.2	18 25 41.889	+ 0.0001	18 28 13.78	·− 0.061
ρ¹ Sagittari .	3.9	19 15 59.380	− 0.0026	18 01 55.90	− 0.005
υ Sagittarii . .	4.7	19 16 06.907	− 0.0005	− 16 08 21.54	− 0.018
ε¹ Sagittarii .	5.6	19 35 06.554	+ 0.0042	16 31 05.86	− 0.054
ε² Sagittarii .	5.0	19 36 54.854	+ 0.0041	16 21 13.98	− 0.020
B. A. C. 6746 .	5.5	19 37 58.215	+ 0.0102	15 41 52.36	− 0.206
g Sagittarii .	5.0	19 52 23.538	− 0.0004	− 15 45 05.77	− 0.089

MEAN PLACES FOR 1902.0. (January 0.584ᵈ, Washington.)

Name of Star.	Magni-tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ʹ ʺ	ʺ
B. A. C. 6992 . .	6.2	20 15 16.213	+ 0.0012	− 15 05 38.76	− 0.004
β Capricorni . .	3.4	20 15 30.355	+ 0.0019	15 05 27.98	− 0.003
B. A. C. 7087 . .	6.2	20 28 44.002	− 0 0002	14 03 28.88	+ 0.052
B. A. C. 7221 . .	6.3	20 45 17.731	+ 0.0094	12 54 28.78	+ 0.057
B. A. C. 7242 . .	6.5	20 47 43.951	. . . .	11 56 40.41	. . . .
8 Aquarii . . .	6.8	20 54 31.733	− 0.0030	‥ 13 25 59.69	− 0.012
ν Aquarii , . .	4.6	21 04 15.395	+ 0.0055	11 46 07.16	− 0.016
14 Aquarii . . .	6.9	21 11 02.143	− 0.0012	9 37 24.03	− 0.013
17 Aquarii . · .	6.4	21 17 40.974	− 0.0041	9 44 13.92	− 0.030
19 Aquarii . . .	5.7	21 19 57.033	− 0.0008	10 09 57.17	− 0.170
B. A. C. 7562 . .	5.5	21 39 41.787	+ 0.0047	− 9 29 14.26	0.000
c¹ Capricorni . .	5.2	21 39 46.745	− 0.0005	9 31 57.77	− 0.005
c² Capricorni . .	6.2	21 41 02.551	− 0.0008	9 43 42.79	− 0.007
30 Aquarii . . .	5.6	21 58 07.162	+ 0.0015	6 59 46.28	+ 0.001
B. A. C. 7690 . .	7.0	22 00 56.522	+ 0.0041	5 49 54.9 ·	. . . .
B. A. C. 7704 . .	7.3	22 02 33.424	− 0.0022	− 6 18 27.6 .	. . . .
B. A. C. 7717 . .	6.9	22 04 19.668	+ 0.0073	8 00 30.3 .	. . . .
44 Aquarii . . .	5.9	22 11 59.509	− 0.0014	5 52 35.47	+ 0.031
51 Aquarii . . .	5.8	22 19 00.629	+ 0.0012	5 19 59.52	− 0.020
κ Aquarii . . .	5.5	22 32 40.936	− 0.0051	4 44 01.08	− 0.122
Lalande 44337 . .	6.3	22 35 43.3 ··	. . . .	− 4 03 45.9 ·	. . . .
B. A. C. 7951 . .	6.7	22 42 46.879	− 0.0150	4 44 14.17	− 0.286
Lalande 44872 . .	7.0	22 52 03.6 ··	. . . .	− 3 46 06.7 ·	. . . .
κ Piscium . . .	5.0	23 21 54.492	+ 0.0046	+ 0 43 07.68	− 0.111
9 Piscium . . .	6.6	23 22 13.633	+ 0.0032	+ 0 35 01.63	− 0.051
12 Piscium . . .	6.8	23 24 28.862	− 0.0009	− 1 34 29.13	− 0.010
13 Piscium . . .	6.4	23 26 55.829	− 0.0006	− 1 37 37.16	+ 0.024
15 Piscium . . .	6.6	23 30 27.781	− 0.0077	+ 0 46 17.54	− 0.041
16 Piscium . . .	5.6	23 31 23.218	− 0.0080	1 33 29.93	+ 0.056
λ Piscium . . .	4.7	23 37 02.744	− 0.0098	1 14 25.66	− 0.172
19 Piscium . . .	5.2	23 41 22.997	− 0.0039	+ 2 56 34.80	− 0.032
21 Piscium . . .	6.1	23 44 26.349	− 0.0018	0 31 55.59	− 0.028
22 Piscium . . .	5.9	23 46 56.738	− 0.0008	2 23 07.86	− 0.020
25 Piscium . . .	6.3	23 48 03.583	+ 0.0001	+ 1 32 43.58	− 0.015

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

| | | The Star's | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
Name.	Mag.	Red'ns from 1902.0 Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
28 Virginis	7.0	+0.80	-2.5	- 6 57.7	1 0 36.5	+ 6 41.4	+0.1566	0.5236	-0.1777	+43	-27
ψ Virginis	5.2	0.76	1.4	9 00.4	7 00 1	-11 16.3	+1.2685	0.5235	0.1737	+81	+48
B. A. C. 4394	5.9	0.67	1.1	8 27.6	14 19.9	- 3 59.3	-0.5854	0.5237	0.1685	+ 1	-76
50 Virginis	6.3	0.68	0.5	9 48.4	14 56.9	- 3 23.4	+0.7885	0.5238	0.1680	+80	+ 9
56 Virginis	7.0	0.66	0.4	9 51.0	17 31.6	- 0 53.4	+0.4067	0.5239	0.1661	+58	-13
58 Virginis	7.0	+0.64	-0.2	-10 01.8	18 55.4	+ 0 27.9	+0.3719	0.5240	-0.1650	+55	-15
62 Virginis	7.0	0.64	+0.1	10 47.4	20 24.0	+ 1 53.9	+0.9644	0.5241	0.1638	+79	+20
a Virginis	1.2	0.61	0.2	10 39.0	22 54.1	+ 4 19.6	+0.4044	0.5244	0.1617	+57	-14
h Virginis	5.5	0.56	0.1	9 39.6	2 2 54.6	+ 8 12.9	-1.3265	0.5248	0.1583	-67	-90
86 Virginis	6.0	0.52	1.3	11 56 1	9 32.8	- 9 20.7	+0.1484	0.5258	0.1523	+40	-27
λ Virginis	4.7	+0.36	+2.6	-12 55.2	3 2 26.4	+ 7 02.5	-1.1952	0.5291	-0.1349	-47	-90
5 Libræ	6.6	0.24	4.0	15 02.7	15 56.0	- 3 52.5	-0.5578	0.5325	0.1191	- 3	-74
a¹ Libræ	5.3	0.22	4.3	15 35.3	18 17.4	- 1 35.4	-0.2328	0.5331	0 1161	+14	-50
a² Libræ	2.9	0.22	4.3	15 38.0	18 23.1	- 1 29.9	-0.1941	0.5332	0.1160	+17	-47
ν¹ Libræ	5.4	0.15	4.8	15 52.6	4 2 12.6	+ 6 05.3	-0.7939	0.5354	0.1058	-19	-90
ν² Libræ	6.9	+0.15	+4.9	-16 06.2	2 18.1	+ 6 10.7	-0.5509	0.5354	-0.1057	- 4	-74
26 Libræ	6.5	0.12	5.4	17 24.1	6 06.6	+ 9 52.1	+0.4958	0.5365	0.1006	+56	- 8
28 Libræ	6.0	0.09	5.7	17 48.1	9 13.4	-11 06.9	+0.6335	0.5375	0.0962	+66	0
ζ² Libræ	7.0	0.05	5.6	17 06.1	13 30.0	- 6 58.3	-0.5423	0.5387	0.0902	- 5	-73
41 Libræ	5.7	+0.02	6.2	18 58.7	18 01.2	- 2 35.6	+1.1465	0.5401	0.0836	+71	+38
47 Libræ	6.4	-0.04	+6.6	-19 05.5	5 1 50.5	+ 4 58.9	+0.6640	0.5424	-0.0719	+67	+ 2
β¹ Scorpii	2.9	0.09	6.8	19 32.1	6 52.1	+ 9 50.9	+0.8137	0.5438	0.0641	+70	+12
ν Scorpii	4.2	0.12	6.8	19 12.3	10 01.6	-11 05.7	+0.2519	0.5445	0.0592	+35	-21
ψ Ophiuchi	4.6	0.17	7.1	19 48.4	15 48 9	- 5 29.5	+0.6030	0.5462	0.0498	+59	- 1
χ Ophiuchi	5.0	0.18	6.8	18 14.0	17 14.3	- 4 06.8	-1.2090	0.5467	0.0475	-58	-90
B. A. C. 5580	5.7	-0.23	+7.1	-19 44.1	6 0 17.1	+ 2 42.4	+0.1605	0.5484	-0.0358	+27	-26
29 Ophiuchi	6.8	0.30	7.1	18 44.4	9 44.7	+11 51.6	-1.2023	0.5505	-0.0197	-60	-90
ξ Ophiuchi	4.5	0 35	7.4	21 00.3	18 41.2	- 3 29.4	+1.1899	0.5522	-0.0042	+69	+46
B. A. C. 6060	6.5	0.44	7.2	18 46.9	7 11 03.1	-11 40.0	- 1.0929	0.5545	+0.0243	-49	-90
B. A. C. 6081	6.5	0.45	7.3	20 19.8	12 55.5	- 9 51.3	+0.6563	0.5546	0.0277	+61	0
B. A. C. 6098	6.0	-0.46	+7.4	-20 44.1	14 08.2	- 8 41.0	+1.1345	0.5547	+0.0298	+69	+39
					NEW MOON.						
B. A. C. 6992	6.2	-0.51	+5.2	-15 05 6	10 6 47.3	+ 5 50.2	+0.4105	0.5514	+0.1329	+53	-13
β Capricorni	3.4	0.51	5.2	15 05.4	6 53.9	+ 5 56.6	+0.4219	0.5512	0.1331	+54	-12
B. A. C. 7087	6.2	-0.49	+5.0	-14 03.4	13 09.0	+11 59.7	+0.1692	0.5501	+0.1412	+39	-26
B. A. C. 7221	6.3	0.46	4.7	12 54.4	20 59.0	- 4 25.8	+0.0544	0.5492	0 1507	+34	- 32
B. A. C. 7242	6.5	0.45	4.8	11 56.6	22 08.6	- 3 18.4	-0.8004	0.5490	0.1520	-15	-90
ν Aquarii	4.6	0.41	4.4	11 46.1	11 6 01.8	+ 4 19.6	+0.2707	0.5473	0.1605	+47	-21
17 Aquarii	6.4	0.37	4.5	9 44.2	12 26.6	+10 32.0	-0.8427	0.5471	0.1670	-15	-90
19 Aquarii	5.7	-0.37	+4.3	-10 09.9	13 31.6	+11 34.9	-0.2054	0.5470	+0.1680	+21	-48
ξ Aquarii	4.8	0.32	4.4	8 17.6	19 33.4	- 6 34.8	-1.1631	0.5464	0 1734	-39	-90
B. A. C. 7562	5.5	0.31	4.0	9 29.2	22 59.4	- 3 15.4	+0.7033	0.5460	0 1762	+80	+ 3
c¹ Capricorni	5.2	0.31	4.0	9 31.9	23 01.8	- 3 13.1	+0.7583	0.5460	0.1763	+75	+ 6
c² Capricorni	6.2	0.31	3.9	9 43.6	23 38.1	- 2 37.9	+1.0727	0.5459	0.17(8	+80	+28
30 Aquarii	5.6	-0.25	+4.1	- 6 59.7	12 7 50.3	+ 5 18.5	-0.3457	0.5453	+0.1828	+15	-56
B. A. C. 7690	7.0	0.21	4.0	5 49.8	9 11.7	+ 6 37.3	-1.3272	0.5452	0.1837	-61	-90
B. A. C. 7704	7.3	9.21	4.0	6 18.4	9 58.4	+ 7 22.4	-0.6810	0.5452	0.1842	- 3	-86
B. A. C. 7717	6.9	0.22	3.6	8 00.4	10 49.4	+ 8 11.9	+1.2720	0.5451	0.1847	+82	+48
44 Aquarii	5.9	0.18	3.8	5 52.5	14 30.7	+11 46.1	-0.2929	0.5449	0.1870	+19	-53
51 Aquarii	5.8	-0.15	+3.8	- 5 19.9	17 53.2	- 8 57.9	-0.2311	0.5449	+0.1888	+22	-49
κ Aquarii	5.5	0.09	3.5	4 44.0	13 0 27.5	- 2 36.1	+0.3895	0.5449	0.1920	+59	-14
Lalande 44337	6.3	0.07	3.6	4 03.7	1 55.3	- 1 10.9	-0.0339	0.5450	0.1925	+33	-37
B. A. C. 7951	6.7	-0.05	3.2	4 44.2	5 18 7	+ 2 05.8	+1.3287	0.5451	0.1938	+85	+58
Lalande 44872	7.0	0.00	3.4	- 3 46.1	9 45.9	+ 6 24.4	+1.1774	0.5454	0.1952	+86	+37
κ Piscium	5.0	+0.16	+3.7	+ 0 43.2	14 0 02.0	- 3 47.0	-0.7049	0.5470	+0.1976	- 3	-89

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

	The Star's				At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1902.0 Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° ′	d h m	h m				°	°
9 Piscium	6.6	+0.16	+ 3.6	+ 0 35.1	14 0 11.1	− 3 38.2	−0 5341	0.5471	+0.1976	+ 7	−71
15 Piscium	6.6	0.20	3.4	0 46.3	4 06.0	+ 0 09.1	+0.0444	0.5478	0.1976	+38	−33
16 Piscium	5.6	0.21	3.6	1 33.6	4 32.3	+ 0 34.5	−0.6873	0.5479	0.1976	− 2	−86
λ Piscium	4.7	0.23	3.4	1 14.5	7 13.3	+ 3 10.4	+0.1739	0.5484	0.1975	+46	−26
19 Piscium	5.2	0.27	3.8	2 56.6	9 16.5	+ 5 09.5	−1.1890	0.5486	0.1973	−38	−87
22 Piscium	5.9	+0.29	+ 3.4	+ 2 23.2	11 54.1	+ 7 42.1	−0.0920	0.5495	+0.1970	+30	−41
25 Piscium	6.3	0.29	3.1	1 32.8	12 25.6	+ 8 12.4	+0.8827	0.5496	0.1969	+90	+14
51 Piscium	5.7	0.54	3.5	6 24.9	15 6 45.5	+ 1 56.1	−0.5854	0.5551	0 1911	+ 4	−73
60 Piscium	6.2	0.62	2.9	6 12.4	13 38.6	+ 8 35.3	+0.9321	0.5577	0.1875	+90	+19
62 Piscium	6.0	0.63	3.0	6 45.9	14 02.8	+ 8 58.7	+0.4334	0.5579	0.1872	+63	−11
δ Piscium	4.8	+0.64	+ 3.1	+ 7 03.2	14 13.5	+ 9 09.0	+0.1720	0.5580	+0.1871	+46	−25
ε Piscium	4.5	0.72	2.7	7 21.8	20 42.5	− 8 35.2	+1.0512	0.5607	0.1827	+90	+28
100 Piscium	6.8	0.95	3.1	12 03.5	16 10 54.9	+ 5 07.8	−1.2359	0.5675	0.1705	−46	−78
π Piscium	5.5	0.96	2.9	11 38.5	11 54.4	+ 6 05.3	−0.6422	0.5680	0.1694	0	−74
B. A. C. 490	7.5	0.97	2.8	11 34.7	12 09.3	+ 6 19.6	−0.5364	0.5681	0.1692	+ 6	−66
B. A. C. 609	6.2	+1.09	+ 2.0	+11 49.2	21 38.2	− 8 31.6	+0.7736	0.5731	+0.1587	+90	+12
29 Arietis	6.3	1.32	1.5	14 36.1	17 11 52.6	+ 5 11.8	+0.0786	0.5811	0.1395	+40	−24
o Arietis	5.8	1.39	1.1	14 53.8	16 44.7	+ 9 53.0	+0.4410	0.5837	0.1321	+64	− 4
σ Arietis	5.5	1.42	0.6	14 40.7	19 37.9	−11 20.3	+1.0355	0.5853	0.1275	+90	+34
53 Arietis	6.3	1.55	+ 0.8	17 30.1	18 2 10.0	− 5 02.8	−1.0152	0.5889	0.1165	−27	−72
B. A. C. 1240	5.7	+1.83	− 1.8	+17 55.0	23 38.0	− 8 24.8	+0.6410	0.5993	+0.0754	+85	+14
ω¹ Tauri	5.8	1.89	1.9	19 21.0	19 2 54.9	− 5 15.5	−0.5583	0.6005	0.0680	+ 4	−57
W.B.(2),iv.248	5.9	1.93	2.7	18 30.4	7 21.2	− 0 58.8	+0.5693	0.6022	0.0590	+76	+11
B. A. C. 1361	6.5	1.96	2.9	18 49.0	9 07.7	+ 0 42.5	+0.3611	0.6028	0.0552	+59	0
ε Tauri	3.6	1.97	3.0	18 57.7	10 33.7	+ 2 05.1	+0.2915	0.6033	0.0520	+54	− 4
B. A. C. 1468	6.3	·2.04	− 4.1	+18 33.4	17 27.6	+ 8 42.5	+1.0034	0.6052	+0.0366	+90	+41
i Tauri	5.2	2.06	4.4	18 40.3	19 26.2	+10 36.2	+0.9557	0.6057	0.0322	+90	+37
B. A. C. 1563	6.5	2.14	4.9	19 40.3	20 0 55.1	− 8 08.0	+0.0986	0.6067	0.0196	+41	−12
m Tauri	5.1	2.12	5.3	18 30.7	1 39.3	− 7 25.5	+1.2708	0.6068	0.0181	+90	+71
l Tauri	5.4	2.15	4.9	20 17.3	1 47.4	− 7 17.7	−0.5022	0.6068	0.0180	+ 7	−48
107 Tauri	6.5	·2.15	− 5.1	+19 43.9	2 11.8	− 6 54.3	+0.0613	0.6069	+0.0167	+39	−14
B. A. C. 1651	6.5	2.19	5.8	19 42.8	6 52.9	− 2 24.6	+0.1317	0.6074	+0.0058	+44	− 9
B. A. C. 1733	6.3	2.25	6.3	20 24.2	11 46.8	+ 2 17.4	−0.5563	0.6077	−0.0055	+ 4	−51
B. A. C. 1796	7.5	2.26	6.9	18 56.2	15 13.2	+ 5 35.6	+0.8760	0.6078	0.0135	+90	+34
127 Tauri	6.3	2.24	7.1	18 55.8	15 22.8	+ 5 44.8	+0.8806	0.6077	0.0145	+90	+34
Lalande 11088	6.1	+2.29	− 7.4	+19 50.5	19 02.3	+ 9 15.4	−0.0958	0.6076	−0.0223	+30	−22
B. A. C. 1867	7.2	2.30	7.4	20 16.4	19 23.4	+ 9 35.7	−0.5358	0.6076	0.0232	+ 4	−51
χ¹ Orionis	4.6	2.30	7.5	20 15.4	19 48.7	+10 00.0	−0.5285	0.6075	0.0241	+ 5	−51
χ² Orionis	5.8	2.29	7.6	19 43.7	20 01.6	+10 12.4	−0.0066	0.6075	0.0246	+35	−17
χ³ Orionis	5.1	2.31	8.0	19 41.4	23 19.5	−10 37.8	−0.0619	0.6072	0.0322	+32	−21
χ⁴ Orionis	4.8	+2.32	− 8.0	+20 08.3	23 30.0	−10 27.6	−0.5160	0.6072	−0.0326	+ 6	−51
68 Orionis	5.6	2.33	8.4	19 48.6	21 2 39.0	− 7 26.3	−0.3014	0.6067	0.0398	+18	−36
71 Orionis	5.1	2.33	8.7	19 11.2	3 45.8	− 6 22.2	+0.2757	0.6066	0.0423	+53	− 4
ν Geminorum	4.2	2.37	9.3	20 16.3	9 14.4	− 1 06.7	−1.0749	0.6054	0.0546	−32	−70
20 Geminorum	6.3	2.34	9.8	17 50.8	10 34.8	+ 0 10.4	+1.2777	0.6051	0.0575	+90	+71
21 Geminorum	6.5	+2.34	− 9.8	+17 51.1	10 35.1	+ 0 10.7	+1.2724	0.6050	−0.0575	+90	+68
22 Geminorum	7.2	2.37	9.7	19 30.1	11 28.6	+ 1 02.1	−0.4324	0.6049	0.0595	+10	−48
26 Geminorum	5.0	2.35	10.3	17 44.3	14 32.5	+ 3 58.7	+1.1412	0.6040	0.0661	+90	+50
W.B.(2),vi,1630	5.9	2.38	11.2	17 53.5	22 25.9	+11 33.3	+0.4004	0.6013	0.0828	+61	− 1
λ Geminorum	3.6	2.37	12.0	16 42.8	22 4 41.4	− 6 25.9	+1.0254	0.5987	0.0953	+90	+37
W. 7ʰ 685	5.6	+2.39	−12.5	+17 17.6	10 11.1	− 1 09.0	−0.1086	0.5961	−0.1059	+30	−31
68 Geminorum	5.0	2.37	12.6	16 02.0	10 56.0	− 0 25.8	+1.0773	0.5958	0.1073	+90	+40
f Geminorum	5.2	2.39	12.7	16 53.7	13 16.8	+ 1 49.5	−1.0518	0.5946	0.1117	−29	−72
1 Cancri	5.9	2.37	13.4	16 02.9	20 27.5	+ 8 43.9	−0.0402	0.5907	0.1242	+34	−29
B. A. C. 2649	6.3	2.37	13.4	16 46.7	21 04.6	+ 9 19.6	−0.8545	0.5904	0.1253	−14	−73
5 Cancri	6.3	+2.38	−13.6	+16 43.3	22 18.4	+10 30.6	−0.9524	0.5897	−0.1273	−21	−73

OCCULTATIONS, 1902.

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

		The Star's			At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1902.0 Δα	Δδ	Apparent Declination.	Washington Mean Time. d h m	Hour Angle, H h m	Y	x'	y'	N.	S.
		s	"	° ′		h m				°	°
29 Cancri	5.9	+2.34	−14.4	+14 31.9	23 9 39.0	− 2 32.2	−0.2843	0.5830	−0.1447	+20	−45
A¹ Cancri	5.6	2.31	14.7	13 01.7	15 51.8	+ 3 25.0	+0.3159	0.5792	0.1531	+55	−13
A² Cancri	5.8	2.30	14.8	12 27.9	17 28.2	+ 4 57.9	+0.6401	0.5782	0.1552	+82	+ 5
60 Cancri	5.7	2.30	14.9	11 59.8	21 20.9	+ 8 42.2	+0.5083	0.5757	0.1599	+69	+ 3
a Cancri	4.3	2.28	15.0	12 14.0	22 27.1	+ 9 49.9	+0.0903	0.5751	0.1612	+40	−26
κ Cancri	5.1	+2.26	−15.1	+11 03.5	24 2 30.1	−10 19.6	+0.6277	0.5726	−0.1657	+81	+ 3
ω Leonis	5.6	2.22	15.2	9 28.8	11 39.8	− 1 29.2	+0.6881	0.5669	0.1745	+88	+ 5
λ Leonis	5.4	2.21	15.2	10 08.6	13 13.6	+ 0 01.4	−0.2678	0.5660	0.1759	+20	−48
o Leonis	3.8	2.19	15.3	10 20.0	17 21.8	+ 4 01.1	−1.1992	0.5634	0.1792	−40	−80
11 Sextantis	6.0	2.16	15.2	8 46.7	25 1 05.8	+11 29.4	−1.0052	0.5588	0.1844	−23	−81
π Leonis	5.0	+2.13	−15.1	+ 8 30.6	2 03.6	−11 34.9	−0.9072	0.5583	−0.1850	−15	−82
34 Sextantis	6.7	2.04	14.1	4 05.5	21 57.5	+ 7 39.8	−0.0870	0.5477	0.1929	+31	−40
36 Sextantis	6.6	2.03	13.9	3 00.0	23 10.3	+ 8 50.3	+0.8220	0.5474	0.1933	+90	+10
p³ Leonis	6.2	1.96	13.4	2 29.0	26 9 39.8	− 5 00.3	−0.6702	0.5424	0.1942	− 1	−84
p⁶ Leonis	5.5	1.95	12.8	+ 0 47.6	12 59.5	− 1 46.9	+0.8175	0.5411	0.1942	+90	+10
ν Leonis	4.4	+1.87	−12.1	− 0 17.2	27 0 22.0	+ 9 15.3	−0.5983	0.5370	−0.1929	+ 3	−76
B. A. C. 4134	6.0	1.72	10.0	3 24.7	20 57.5	+ 5 12.0	−1.1744	0.5317	0.1858	−37	−90
B. A. C. 4225	6.3	1.67	9.2	. 4 30.9	28 3 45.7	+11 47.8	−1.2443	0.5305	0.1823	−45	−90
f Virginis	5.9	1.66	8.8	5 17.7	6 21.5	− 9 41.1	−0.8760	0.5301	0.1808	−15	−90
χ Virginis	4.7	1.67	8.0	7 27.5	7 35.9	− 8 29.1	+1.2376	0.5300	0.1801	+83	+44
28 Virginis	7.0	+1.65	− 8.1	− 6 57.8	8 58.1	− 7 09.2	+0.4572	0.5299	−0.1792	−63	−11
B A.C. 4394	5.9	1.55	6.6	8 27.6	22 26.4	+ 5 54.8	−0.2724	0.5288	0.1698	+19	−51
50 Virginis	6.3	1.56	6.1	9 48.5	23 02.9	+ 6 30.2	+1.0904	0.5288	0.1693	+80	+30
56 Virginis	7.0	1.53	5.8	9 51.1	29 1 34.9	+ 8 57.6	+0.7126	0.5287	0.1673	+80	+ 4
58 Virginis	7.0	1.52	5.6	10 01.9	2 57.4	+10 17.6	+0.6790	0.5287	0.1662	+79	+ 2
62 Virginis	7.0	+1.52	− 5.3	−10 47.5	4 24.8	+11 42.3	+1.2662	0.5287	−0.1649	+79	+49
a Virginis	1.2	1.49	5.1	10 39.1	6 52.5	− 9 54.4	+0.7113	0.5287	0.1629	+79	+ 4
λ Virginis	5.5	1.44	5.2	9 39.7	10 49.5	− 6 04.5	−1.0067	0.5288	0.1594	−26	−90
86 Virginis	6.0	1.41	3.9	11 56.2	17 22.7	+ 0 16.9	+0.4573	0.5295	0.1533	+60	−10
λ Virginis	4.7	1.25	2.2	12 55.3	30 10 06.4	− 7 29.7	−0.8844	0.5309	0.1358	−21	−90
5 Libræ	6.6	+1.14	− 0.3	−15 02.8	23 31.5	+ 5 30.8	−0.2587	0.5330	−0.1198	+14	−51
a¹ Libræ	5.3	1.12	0.0	15 35.4	31 1 52.4	+ 7 47.3	+0.0631	0.5336	0.1169	+31	−32
a² Libræ	2.9	1.12	+ 0.1	15 38.1	1 58.1	+ 7 52.8	+0.1016	0.5336	0.1168	+34	−30
ν¹ Libræ	5.4	1.04	0.8	15 52.6	9 46.4	− 8 33.3	−0.5028	0.5352	0.1066	− 1	−69
ν² Libræ	6.9	1.03	0.8	16 06.3	9 51.9	− 8 27.9	−0.2607	0.5352	0.1065	+12	−51
26 Libræ	6.5	+1.01	+ 1.6	−17 24.1	13 40.1	− 4 46.8	+0.7791	0.5360	−0.1013	+72	+ 9
28 Libræ	6.0	0.98	2.0	17 48.2	16 46.9	− 1 45.7	+0.9135	0.5367	0.0970	+72	+18
ζ¹ Libræ	5.7	0.94	1.7	16 22.5	20 25.2	+ 1 45.8	−1.0107	0.5375	0.0919	−35	−90
ζ² Libræ	7.0	0.93	2.1	17 06.1	21 03.7	+ 2 23.1	−0.2640	0.5377	0.0910	+10	−52
ζ³ Libræ	6.0	0.92	1.8	16 16.4	21 36.3	+ 2 54.6	−1.2310	0.5378	0.0902	−56	−90
ζ⁴ Libræ	5.8	+0.92	+ 2.0	−16 31.2	22 42.2	+ 3 58.4	−1.0557	0.5380	−0.0887	−38	−90

FEBRUARY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time. d h m	Hour Angle, H h m	Y	x'	y'	N.	S.
47 Libræ	6.4	+0.82	+ 3.5	−19 05.6	1 9 25.7	− 9 38.2	+0.9248	0.5406	−0.0728	+71	+19
β¹ Scorpii	2.9	0.79	4.0	19 32.2	14 28.2	− 4 45.2	+1.0678	0.5415	0.0651	+70	+31
ν Scorpii	4.2	0.73	4.1	19 12.3	17 38.5	− 1 41.0	+0.5024	0.5426	0.0602	+52	− 7
ψ Ophiuchi	4.6	0.66	4.6	19 48.4	23 27.3	+ 3 56.6	+0.8447	0.5440	0.0510	+70	+15
χ Ophiuchi	5.0	0.65	4.2	18 14.0	2 0 53.0	+ 5 19.6	−0.9674	0.5443	0.0487	−36	−90
B. A. C. 5580	5.7	+0.57	+ 5.0	−19 44.1	7 57.8	−11 49.2	+0.3886	0.5459	−0.0372	+42	−13
29 Ophiuchi	6.8	0.46	5.2	18 44.4	17 28.2	− 2 37.2	−0.9881	0.5480	−0.0213	−41	−90
B. A. C. 6060	6.5	0.21	6.0	18 46.9	18 53.4	− 2 01.9	−0.9264	0.5525	+0.0223	−36	−90
B. A. C. 6081	6.5	0.20	6.5	20 19.8	3 20 46.1	− 0 12.9	+0.8165	0.5526	0.0255	+70	+12
16 Sagittarii	6.2	0.14	6.6	20 24.9	4 3 52.0	+ 6 38.9	+1.1323	0.5536	0.0378	+70	+38
B. A. C. 6287	5.7	+0.07	+ 6.3	−18 47.4	10 52.3	−10 34.6	−0.3381	0.5542	+0.0499	+ 1	−57

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

Name.	Mag.	Red'ns from 1902.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
B. A. C. 6294	5.2	+0.06	+ 6.2	−18 28.1	4 11 27.6	−10 00.5	−0.6583	0.5543	+0.0509	−17	−87
ρ¹ Sagittarii	3.9	−0.09	6.1	18 01.8	5 10 49.0	−11 25.7	+0.5159	0.5553	0.0899	+56	− 7
ρ² Sagittarii	6.1	0.10	6.2	18 29.3	10 53.2	−11 21.5	+1.0175	0.5553	0.0900	+72	+26
c¹ Sagittarii	5.6	0.15	5.7	16 31.0	19 41.9	− 2 50.4	−0.2583	0.5556	0.1039	+12	−51
c² Sagittarii	5.0	0.15	5.7	16 21.1	20 32.2	− 2 01.7	−0.3476	0.5552	0.1054	+ 7	−57
B. A. C. 6746	5.5	−0.15	+5.6	−15 41.8	21 01.7	− 1 33.2	−1.0024	0.5552	+0.1060	−33	−90
g Sagittarii	5.0	0.18	5.4	15 45.0	6 3 44.1	+ 4 55.9	−0.1981	0.5551	0.1160	+15	−47
				NEW	*MOON.*						
B. A. C. 7951	6.7	−0.14	+2.1	− 4 44.2	9 11 37.3	+10 11.8	+1.1507	0.5525	+0.1942	+85	+34
Lalande 44872	7.0	−0.12	+2.0	− 3 46.1	15 58.6	− 9 35.5	+0.9911	0.5528	+0.1956	+86	+22
κ Piscium	5.0	0.01	1.9	+ 0 43.2	10 5 56.8	+ 3 55.3	−0.9049	0.5541	0.1982	−16	−89
9 Piscium	6.6	−0.01	1.9	0 35.1	6 05.7	+ 4 03.9	−0.7358	0.5541	0.1982	− 6	−85
15 Piscium	6.6	+0.01	1.7	0 46.3	9 56.0	+ 7 46.5	−0.1685	0.5547	0.1982	+26	−45
16 Piscium	5.6	0.02	1.8	1 33.5	10 21.7	+ 8 11.4	−0.8961	0.5548	0.1982	−15	−88
λ Piscium	4.7	+0.04	+1.6	+ 1 14.5	12 59.6	+10 44.1	−0.0461	0.5552	+0.1981	+33	−38
22 Piscium	5.9	0.08	1.6	2 23.2	17 35.2	− 8 49.4	−0.3178	0.5561	0.1975	+18	−54
25 Piscium	6.3	0.07	1.4	1 32.7	18 06.1	− 8 19.6	+0.6496	0.5561	0.1975	+84	+ 1
51 Piscium	5.7	0.26	1.3	6 24.9	11 12 08.9	+ 9 06.9	−0.8358	0.5602	0.1915	−11	−84
60 Piscium	6.2	0.32	0.9	6 12.4	18 57.0	− 8 18.9	+0.6678	0.5621	0.1877	+84	+ 3
62 Piscium	6.0	+0.33	+1.0	+ 6 45.9	19 20.9	− 7 55.8	+0.1703	0.5622	+0.1874	+45	−25
δ Piscium	4.8	0.33	1.1	7 03.1	19 31.5	− 7 45.6	−0.0904	0.5624	0.1873	+30	−39
ε Piscium	4.5	0.40	0.7	7 21.8	12 1 56.7	− 1 33.7	+0.7799	0.5643	0.1828	+90	+10
π Piscium	5.5	0.60	0.8	11 38.4	17 04.0	−10 57.9	−0.9206	0.5696	0.1693	−17	−78
B. A. C. 490	7.5	0.60	+0.8	11 34.7	17 18.8	−10 43.7	−0.8151	0.5697	0.1690	−10	−78
54 Ceti	5.5	+0.65	0.0	+10 33.5	23 05.6	− 5 09.1	+1.1832	0.5719	+0.1627	+90	+43
B. A. C. 609	6.2	0.71	+0.1	11 49.2	13 2 47.8	− 1 34.7	+0.4930	0.5734	0.1583	+68	− 4
29 Arietis	6.3	0.92	−0.2	14 36.0	17 06.9	−11 46.6	−0.2037	0.5791	0.1390	+24	−40
o Arietis	5.8	0.98	0.6	14 53.8	22 02.0	− 7 02.3	+0.1613	0.5811	0.1316	+45	−19
σ Arietis	5.5	1.02	1.0	14 40.7	14 0 57.1	− 4 13.7	+0.7604	0.5822	0.1270	+90	+15
B. A. C. 1206	6.0	+1.38	−2.8	+17 02.1	15 2 22.2	− 3 45.9	+1.0373	0.5913	+0.0815	+90	+39
B. A. C. 1240	5.7	1.44	2.8	17 55.0	5 27.7	− 0 47.5	+0.3864	0 5922	0.0754	+60	− 1
ω¹ Tauri	5.8	1.50	2.7	19 21.0	8 49.3	+ 2 26.3	−0.8227	0.5932	0.0686	−12	−71
W.B.(2),iv,248	5.9	1.55	3.6	18 30.4	13 22.3	+ 6 48.9	+0.3219	0.5943	0.0593	+56	− 3
B. A. C. 1361	6.5	1.58	3.7	18 49.0	15 11.6	+ 8 33.9	+0.1136	0.5947	0.0555	+42	−15
δ³ Tauri	5.0	+1.58	−3.9	+17 42.2	15 25.7	+ 8 47.6	+1.2538	0.5948	+0.0550	+90	+64
ε Tauri	3.6	1.61	3.8	18 57.7	16 39.9	+ 9 58.8	+0.0449	0.5951	0.0524	+38	−17
B. A. C. 1468	6.3	1.69	4.7	18 33.4	23 45.3	− 7 12.3	+0.7746	0.5964	0.0374	+90	+26
i Tauri	5.2	1.71	5.0	18 40.3	16 1 47.4	− 5 14.9	+0.7292	0.5966	0.0330	+90	+23
B. A. C. 1563	6.5	1.80	5.3	19 40.2	7 26.1	+ 0 10.5	−0.1305	0.5973	0.0208	+28	−24
m Tauri	5.1	+1.79	−5.8	+18 30.7	8 11.6	+ 0 54.2	+1.0574	0.5974	+0.0191	+90	+47
l Tauri	5.4	1.82	5.2	20 17.3	8 20.0	+ 1 02.4	−0.7384	0.5974	0.0188	− 7	−70
107 Tauri	6.5	1.82	5.5	19 43.9	8 45.0	+ 1 26.3	−0.1664	0.5974	0.0179	+26	−26
B. A. C. 1651	6.5	1.88	6.1	19 42.8	13 34.9	+ 6 04.9	−0.0877	0.5977	+0.0073	+30	−20
119 Tauri	4.6	1.91	7.0	18 31.2	18 05.7	+10 25.2	+1.1326	0.5978	−0.0026	+90	+54
120 Tauri	5.3	+1.91	−7.0	+18 28.1	18 37.2	+10 55.5	+1.1824	0.5978	−0.0029	+90	+59
B. A. C. 1733	6.3	1.94	6.4	20 24.2	18 38.1	+10 56.3	−0.7769	0.5978	0.0039	−10	−70
B. A. C. 1796	7.5	1.98	7.1	18 56.2	22 11.0	− 9 39.1	+0.6810	0.5980	0.0115	+90	+23
127 Tauri	6.3	1.97	7.4	18 55.8	22 21.0	− 9 29.4	+0.6858	0.5980	0.0119	+90	+23
Lalande 11088	6.1	2.02	7.6	19 50.5	17 2 07.5	− 5 51.8	−0.2974	0.5975	0.0201	+18	−34
B. A. C. 1867	7.2	+2.03	−7.5	+20 16.4	2 29.4	− 5 30.7	−0.7429	0.5975	−0.0209	− 8	−70
χ¹ Orionis	4.6	2.04	7.5	20 15.4	2 55.4	− 5 05.7	−0.7347	0.5975	0.0219	− 7	−70
χ² Orionis	5.8	2.03	7.7	19 43.7	3 08.9	− 4 52.7	−0.2052	0.5975	0.0224	+23	−29
χ³ Orionis	5.1	2.07	8.1	19 41.4	6 33.2	− 1 36.4	−0.2552	0.5971	0.0298	+21	−32
χ⁴ Orionis	4.8	2.08	8.0	20 08.3	6 43.9	− 1 26.1	−0.7151	0.5970	0.0301	− 6	−69
68 Orionis	5.6	+2.10	−8.5	+19 48.6	9 59.1	+ 1 41.5	−0.4916	0.5966	−0.0372	+ 7	−49

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

Name.	Mag.	Red'ns from 1902.0 Δα	Red'ns from 1902.0 Δδ	Apparent Declination.	Washington Mean Time. (d h m)	Hour Angle, H (h m)	Y	x'	y'	Limiting Parallels. N.	Limiting Parallels. S.
		s	"	° '	d h m	h m				°	°
71 Orionis	5.1	+2.10	− 8.8	+19 11.2	17 11 08.0	+ 2 47.7	+0.0958	0.5964	−0.0395	+41	−14
ν Geminorum	4.2	2.17	9.2	20 16.3	16 47.1	+ 8 13.7	−1.2626	0.5954	0.0516	−60	−70
20 Geminorum	6.3	2.15	10.0	17 50.8	18 10.2	+ 9 33.6	+1.1258	0.5952	0.0545	+90	+49
21 Geminorum	6.5	2.15	10 0	17 51.1	18 10.5	+ 9 33.9	+1.1204	0.5952	0.0545	+90	+49
22 Geminorum	7.2	2.19	9.7	19 30.1	19 05.7	+10 26.9	−0.6065	0.5950	0.0564	+ 1	−60
26 Geminorum	5.0	+2.19	−10.5	+17 44.3	22 15.4	−10 30 6	+0.9956	0.5942	−0.0629	+90	+37
W.B.(2),vi,1630	5.9	2.26	11.4	17 53.5	18 6 23.6	− 2 41.2	+0.2615	0.5919	0.0793	+51	− 8
λ Geminorum	3.6	2.29	12.3	16 42.8	12 50.3	+ 3 30.8	+0.9092	0.5898	0.0916	+90	+28
W. B. 7ʰ 685	5.6	2.33	12.7	17 17.6	18 29.4	+ 8 57.1	−0.2279	0.5877	0.1023	+23	−38
67 Geminorum	7.5	2.32	13.1	15 50.8	19 10.8	+ 9 37.1	+1.1758	0.5874	0.1032	+90	+50
68 Geminorum	5.0	+2.32	−13.1	+16 02.0	19 15.6	+ 9 41.7	+0.9759	0.5874	−0.1034	+90	+32
f Geminorum	5.2	2.36	12.9	17 53.7	21 40.2	−11 59.1	−1.1748	0.5865	0.1077	−41	−72
1 Cancri	5.9	2.38	13.9	16 02.9	19 5 02.3	− 4 53.5	−0.1321	0.5834	0.1202	+28	−34
B. A. C. 2649	6.3	2.39	13.8	16 46.7	5 40.4	− 4 16.7	−0.9551	0.5831	0.1212	−21	−73
5 Cancri	6.3	2.40	13.9	16 43.3	6 56.0	− 3 04.0	−1.0506	0.5825	0.1232	−29	−73
29 Cancri	5.9	+2.42	−15.2	+14 31.9	18 32.1	+ 8 06.7	−0.3446	0.5772	−0.1406	+16	−49
A¹ Cancri	5.6	2.43	15.8	13 01.7	20 0 52.4	− 9 46.5	+0.2782	0.5741	0.1491	+52	−14
A² Cancri	5.8	2.42	15.9	12 27.9	2 30.6	− 8 11.8	+0.6101	0.5734	0.1512	+79	+ 4
60 Cancri	5.7	2.43	16.2	11 59.8	6 27.2	− 4 23.5	+0.4872	0.5715	0.1560	+67	− 4
a Cancri	4.3	2.44	16.2	12 14.0	7 34.6	− 3 18.6	+0.0681	0.5710	0.1574	+39	−27
κ Cancri	5.1	+2.43	−16.5	+11 03.5	11 41.4	+ 0 39.7	+0.6208	0.5689	−0.1619	+80	+ 3
ω Leonis	5.6	2.42	17.0	9 28.7	20 58.3	+ 9 37.3	+0.7058	0.5644	0.1711	+90	+ 7
h Leonis	5.4	2.45	16.9	10 08.6	22 33.0	+11 08.8	−0.2520	0.5637	0.1725	+21	−47
o Leonis	3.8	2.44	17.0	10 20.0	21 2 43.6	− 8 49.2	−1.1776	0.5617	0.1759	−38	−80
11 Sextantis	6.0	2.45	17.2	8 46.6	10 31.2	− 1 17.3	−0.9603	0.5581	0.1815	−20	−81
π Leonis	5.0	+2.45	−17.3	+ 8 30.6	11 29.3	− 0 21.1	−0.8590	0.5576	−0.1822	−13	−81
14 Sextantis	6.6	2.43	17.3	6 05.1	14 33.4	+ 2 36.8	+1.1010	0.5563	0.1840	+90	+31
16 Sextantis	6.9	2.44	17.3	6 38.8	15 41.6	+ 3 42.8	+0.3072	0.5559	0.1846	+54	−17
34 Sextantis	6.7	2.42	17.1	4 05.4	22 7 25.5	− 5 04.2	+0.0174	0.5494	0.1910	+36	−34
35 Sext. (1ˢᵗ star)	6.2	2.43	17.1	5 15.3	7 45.1	− 4 45.1	−1.2663	0.5493	0.1911	−48	−85
36 Sextantis	6.6	+2.41	−17.1	+ 2 59.9	8 38.2	− 3 53.8	+0.9308	0.5490	−0.1913	+90	+18
p³ Leonis	6.2	2.41	16.7	2 29.0	19 05.4	+ 6 13.3	−0.5366	0.5453	0.1930	+ 6	−70
p⁵ Leonis	5.5	2.39	16.4	0 27.5	22 24.0	+ 9 25.6	+0.9595	0.5443	0.1931	+90	+19
76 Leonis	6.3	2.40	16.5	+ 2 11.0	23 0 53.7	+11 50.5	−1.3428	0.5435	0.1931	−64	−88
ν Leonis	4.4	2.38	15.8	− 0 17.2	9 42.1	− 3 37.6	−0.4287	0.5410	0.1922	+12	−62
B. A. C. 4134	6.0	+2.32	−14.1	− 3 24.8	24 6 03.3	− 7 54.2	−0.9602	0.5368	−0.1858	−20	−90
B. A. C. 4200	5.7	2.31	13.7	4 04.6	10 53.2	− 3 13.3	−1.1432	0.5361	0.1834	−35	−90
B. A. C. 4225	6.3	2.30	13.5	4 31.0	12 46.2	− 1 23.7	−1.0170	0.5359	0.1824	−24	−90
f Virginis	5.9	2.29	13.1	5 17.7	15 20.0	+ 1 05.4	−0.6458	0.5356	0.1809	− 1	−82
28 Virginis	7.0	2.28	12.6	6 57.9	17 54.4	+ 3 35.0	+0.6871	0.5354	0.1796	+82	+ 3
B. A. C. 4294	6.1	+2.27	−12.5	− 5 46.1	20 42.4	+ 6 12.9	−1.1024	0.5349	−0.1777	−32	−90
B. A. C. 4394	5.9	2.23	11.1	8 27.7	25 7 11.7	− 7 32.0	−0.0201	0.5342	0.1702	+32	−36
56 Virginis	7.0	2.21	10.5	9 51.2	10 17.6	− 4 31.8	+0.9648	0.5341	0.1677	+80	+21
58 Virginis	7.0	2.20	10.2	10 02.0	11 39.0	− 3 12.9	+0.9327	0.5340	0.1666	+80	+18
a Virginis	1.2	2.19	9.8	10 39.2	15 30.9	+ 0 31.9	+0.9697	0.5340	0.1633	+79	+21
h Virginis	5.5	+2.18	− 9.7	− 9 39.8	19 24.7	+ 4 18.6	−0.7361	0.5340	−0.1599	− 8	−90
86 Virginis	6.0	2.15	8.4	11 56.3	26 1 52.7	+10 34.7	+0.7284	0.5341	0.1537	+78	+ 5
λ Virginis	4.7	2.04	6.4	12 55.3	18 24.9	+ 2 36.5	−0.5950	0.5349	0.1361	− 3	−78
5 Libræ	6.6	1.96	4.4	15 02.9	27 7 42.7	− 8 30.2	+0.0344	0.5362	0.1201	+29	−33
a¹ Libræ	5.3	1.94	4.0	15 35.5	10 02.5	− 6 14.8	+0.3560	0.5365	0.1171	+48	−15
a² Libræ	2.9	+1.94	− 3.9	−15 38.2	10 08.2	− 6 09.2	+0.3943	0.5365	−0.1170	+51	−13
ν¹ Libræ	5.4	1.87	3.0	15 52.7	17 53.6	+ 1 21.7	−0.2071	0.5374	0.1068	+15	−48
ν² Libræ	6.9	1.87	2.9	16 06.4	17 59.1	+ 1 27.2	+0.0345	0.5374	0.1067	+28	−33
26 Libræ	6.5	1.85	2.1	17 24.2	21 46.2	+ 5 07.2	+1.0722	0.5380	0.1015	+73	+31
28 Libræ	6.0	1.82	1.7	17 48.2	28 0 52.1	+ 8 07.2	+1.2067	0.5384	0.0972	+72	+46
ζ¹ Libræ	5.7	+1.79	− 1.7	−16 22.5	4 29.6	+11 37.9	−0.7136	0.5389	−0.0921	−15	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

Name.	Mag.	Red'ns from 1902.0 Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
ζ³ Libræ	7.0	+1.78	-1.4	-17 06.2	28 5 08.0	-11 44.9	+0.0316	0.5390	-0.0912	+26	-34
ζ³ Libræ	6.0	1.77	1.7	16 16.4	5 40.6	-11 13.3	-0.9327	0.5391	0.0904	-29	-90
ζ⁴ Libræ	5.8	1.77	-1.5	16 31.3	6 46.3	-10 09.7	-0.7590	0.5394	0.0888	-19	-90
47 Libræ	6.4	1.68	+0.5	19 05.6	17 28.9	+ 0 12.8	+1.2168	0.5408	0.0731	+71	+49

MARCH.

Name.	Mag.	Red'ns from 1902.0 Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
ν Scorpii	4.2	+1.60	+1.3	-19 12.4	1 1 42.3	+ 8 10.6	+0.7921	0.5421	-0.0605	+71	+11
ψ Ophiuchi	4.6	1.54	2.1	19 48.5	7 32.0	-10 10.9	+1.1319	0.5431	0.0513	+70	+38
χ Ophiuchi	5.0	+1.51	+1.7	-18 14.0	8 58.0	- 8 47.5	-0.6811	0.5433	-0.0491	-17	-90
B. A. C. 5580	5.7	1.44	2.9	19 44.2	16 04.6	- 1 54.6	+0.6719	0.5444	0.0376	+65	+ 3
29 Ophiuchi	6.8	1 33	3 3	18 44.4	2 1 38.5	+ 7 20.9	-0.7140	0.5470	-0.0220	-23	-90
B. A. C. 6060	6.5	1.03	5.2	18 47.0	3 3 17.1	+ 8 09.6	-0.6786	0.5489	+0.0210	-20	-90
B. A. C. 6081	6.5	1.02	5 8	20 19.9	5 11.0	+ 9 59.9	+1.0652	0.5491	0.0242	+70	+32
B. A. C. 6287	5.7	+0.85	+6.0	-18 47.4	19 25.9	- 0 13.1	-0.1100	0.5503	+0.0479	+14	-42
B. A. C. 6294	5.2	0.83	5.9	18 28.1	20 01.7	+ 0 21.5	-0.4315	0.5504	0.0492	- 3	-64
ρ¹ Sagittarii	3.9	0.58	6.5	18 01.8	4 19 37.4	- 0 49.3	+0.7080	0.5518	0.0876	+72	+ 7
ρ² Sagittarii	6.1	0.57	6.6	18 29.3	19 41.4	- 0 45.4	+1.2100	0.5518	0.0877	+71	+47
c¹ Sagittarii	5.6	0.47	6.1	16 31.0	5 4 34.6	+ 7 50.3	-0.0833	0.5521	0.1015	+21	-40
e² Sagittarii	5.0	+0.46	+6.1	-16 21.1	5 25.3	+ 8 39.3	-0.1744	0.5522	+0.1028	+16	-46
B. A. C. 6746	5.5	0.46	5.9	15 41.8	5 55.0	+ 9 08.0	-0.8307	0.5522	0.1035	-22	-90
g Sagittarii	5.0	0.39	6.0	15 45.0	12 40.1	- 8 20.2	-0.0386	0.5528	0.1139	+25	-38
B. A. C. 6992	6.2	0.30	5.8	15 05.5	23 22.6	+ 2 01.1	+0.5534	0.5528	0.1287	+63	- 5
β Capricorni	3.4	0.30	5.8	15 05.4	23 29.2	+ 2 07.6	+0.5643	0.5528	0.1289	+64	- 4
B. A. C. 7087	6.2	+0.25	+5.5	-14 03.4	6 5 40.7	+ 8 06.9	+0.2845	0.5529	+0.1372	+46	-20
B. A. C. 7221	6.3	0.19	5.2	12 54.4	13 25.6	- 8 23.5	+0.1612	0.5532	0.1470	+39	-26
B. A. C. 7242	6.5	0.18	5.0	11 56.6	14 34.1	- 7 17.2	-0.6923	0.5532	0.1483	- 8	-90
ν Aquarii	4.6	0.13	4.8	11 46.0	22 17.7	+ 0 11.1	+0.3039	0.5535	0.1573	+49	-19
17 Aquarii	6.4	0.10	4.3	9 44.2	7 4 34.3	+ 6 15.3	-0.8284	0.5538	0.1642	-15	-90
19 Aquarii	5.7	+0.09	+4.3	-10 09.9	5 37.8	+ 7 16.5	-0.2025	0.5539	+0.1652	+23	-47
ξ Aquarii	4.8	0.07	3.8	8 17.6	11 30.5	-11 02.2	-1.1785	0.5543	0.1710	-41	-90
B. A. C. 7562	5.5	0.05	3 9	9 29.2	14 50.9	- 7 48.5	+0.6492	0.5544	0.1740	+77	+ 1
c¹ Capricorni	5 2	0.05	3.9	9 31.9	14 53.2	- 7 46.3	+0.7032	0.5545	0.1741	+80	+ 4
c² Capricorni	6.2	0.04	+3.9	- 9 43.6	15 28.5	- 7 12.1	+1.0105	0.5546	0.1746	+80	+24

NEW MOON.

Name.	Mag.	Red'ns from 1902.0 Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
ε Piscium	4.5	+0.18	-0.7	+ 7 21.7	11 8 57.1	+ 7 14.4	+0.6184	0.5735	+0.1840	+79	+ 1
π Piscium	5.5	0.30	1.0	11 38.4	23 39.8	- 2 34.5	-1.0839	0.5786	0.1704	-30	-78
B. A. C. 490	7.5	0.30	1.0	11 34.7	23 54.3	- 2 20.6	-0.9809	0 5787	0.1701	-22	-78
54 Ceti	5.5	+0.34	-1.6	+10 33.5	12 5 31.9	+ 3 04.7	+0.9864	0.5806	+0.1637	+90	+26
B. A. C. 609	6.2	0.38	1.6	11 49.1	9 08.6	+ 6 33.5	+0.2998	0.5820	0.1593	+53	-14
29 Arietis	6.3	0.55	2.0	14 36.0	23 07.3	- 3 58.8	-0.4045	0.5868	0.1398	+13	-53
ο Arietis	5.8	0.58	2.3	14 53.8	13 3 56.1	+ 0 39.2	-0.0474	0.5883	0.1323	+33	-30
σ Arietis	5.5	0.63	2.5	14 40.7	6 47.7	+ 3 24.3	+0.5442	0.5892	0.1276	+73	+ 2
B. A. C. 1119	6.4	+0.84	-3.8	+16 13.0	14 2 17.7	- 1 50.3	+1.1512	0 5943	+0.0926	+90	+48
B. A. C. 1206	6.0	0.91	4.1	17 02.1	7 48.9	+ 3 38.1	+0.8090	0.5953	0.0817	+90	+23
B. A. C. 1240	5.7	0.96	4.1	17 55.0	10 52.5	+ 6 24.6	+0.1610	0.5958	0.0756	+45	-14
B. A. C. 1272	6.3	0.98	4.6	17 04.6	13 46.3	+ 9 11.7	+1.2185	0.5962	0.0696	+90	+58
ω¹ Tauri	5.8	1.02	3.9	19 21.0	14 12.3	+ 9 36.6	-1.0431	0.5963	0.0688	-29	-71
W.B.(2),iv,248	5.9	+1.07	-4.6	+18 30.4	18 43.3	-10 02.8	+0.0959	0.5967	+0.0593	+41	-15
B. A. C. 1361	6.5	1.08	4.7	18 49.1	20 31.9	- 8 18.5	-0.1115	0.5970	0.0556	+29	-27
d³ Tauri	5.0	1.08	5.1	17 42.1	20 45.8	-- 8 05.1	+1.0249	0.5970	0.0552	+90	+40
ε Tauri	3.6	1.10	4.7	18 57.7	21 59.7	- 6 54.1	-0.1800	0.5970	0.0526	+25	-30
B. A. C. 1468	6.3	1.19	5.6	18 33.4	15 5 03.6	- 0 06.7	+0.5487	0.5973	0.0375	+74	+12
i Tauri	5.2	+1 21	· -5.7	+18 40.3	7 05.4	+ 1 50.5	+0.5039	0.5973	+0.0332	+70	+10

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

Name.	Mag.	Red'ns from 1902.0 Δα	Δδ	Apparent Declination.	Washington Mean Time. d h m	Hour Angle, H h m	Y	x'	y'	Limiting Parallels. N.	S.
B. A. C. 1563	6.5	+1.30	− 5.9	+19 40.2	15 12 44.1	+ 7 15.9	−0.3536	0.5972	+0.0210	+15	−38
m Tauri	5.1	1.29	6.4	18 30.7	13 29.7	+ 7 59.7	+0.8346	0.5971	0.0194	+90	+31
l Tauri	5.4	1.32	5.8	20 17.3	13 38.0	+ 8 07.7	−0.9605	0.5971	0.0191	−23	−70
107 Tauri	6.5	1.32	6.1	19 43.9	14 03.2	+ 8 31.9	−0.3891	0.5971	0.0182	+13	−41
B. A. C. 1651	6.5	1.37	6.5	19 42.8	18 53.7	−10 48.9	−0.3091	0.5967	0.0077	+18	−34
119 Tauri	4.6	+1.41	− 7.4	+18 31.2	23 25.7	− 6 27.5	+0.9143	0.5962	−0.0021	+9)	+37
120 Tauri	5.3	1.42	7.4	18 28.1	23 57.4	− 5 57.0	+0.9646	0.5961	0.0032	+90	+41
B. A. C. 1733	6.3	1.45	6.8	20 24.2	23 58.3	− 5 57.1	−0.9968	0.5961	0.0033	−27	−70
B. A. C. 1796	7.5	1.48	7.6	18 56.2	16 3 32.5	− 2 30.2	+0.4645	0.5955	0.0110	+68	+10
Lalande 11088	6.1	1.54	7.6	19 50.5	7 30.9	+ 1 18.9	−0.5140	0.5948	0.0194	+ 6	−49
χ¹ Orionis	4.6	+1.55	− 7.7	+20 15.3	8 19.2	+ 2 05.4	−0.9520	0.5946	−0.0211	−22	−70
χ² Orionis	5.8	1.55	7.8	19 43.7	8 32.9	+ 2 18.6	−0.4211	0.5946	0.0216	+11	43
χ³ Orionis	5.1	1.59	8.2	19 41.4	11 59.1	+ 5 36.8	−0.4690	0.5938	0.0290	+ 8	−47
χ⁴ Orionis	4.8	1.60	8.1	20 08.3	12 09.9	+ 5 47.2	−0.9308	0.5937	0.0293	−22	−70
68 Orionis	5.6	1.63	8.5	19 48.6	15 27.2	+ 8 56.9	−0.7046	0.5929	0.0362	− 5	−68
71 Orionis	5.1	+1.64	− 8.8	+19 11.2	16 36.9	+10 03.9	−0.1140	0.5927	−0.0386	+29	−25
20 Geminorum	6.3	1.70	10.0	17 50.8	23 44.6	− 7 04.7	+0.9267	0.5906	0.0531	+90	+34
21 Geminorum	6.5	1.71	10 0	17 51.1	23 44.9	− 7 04.4	+0.9214	0 5906	0.0531	+90	+33
22 Geminorum	7.2	1.73	9.5	19 30.1	17 0 40.9	− 6 10.6	−0.8141	0.5902	0.0551	−12	−70
26 Geminorum	5.0	1.75	10.4	17 44.3	3 53.5	− 3 05.3	+0.7999	0.5892	0.0614	+90	+25
W.B.(2),vi,1630	5.9	+1.84	−11.1	+17 53.5	12 09.8	+ 4 52.3	+0 0698	0.5860	−0.0773	+39	−19
λ Geminorum	3.6	1.90	12.0	16 42 8	18 43.7	+11 11.6	+0.7290	0.5835	0 0894	+90	+17
W. B. 7ʰ 685	5.6	1.96	12.3	17 17.6	18 0 29.5	− 7 15.3	−0 4100	0.5811	0.0996	+12	−49
67 Geminorum	7.5	1.96	12.8	15 50.8	1 11.8	− 6 34.5	+1.0058	0.5808	0.1008	+90	+35
68 Geminorum	5.0	1.96	12.7	16 02.0	1 16.7	− 6 29.8	+0.8045	0 5808	0.1009	+90	+20
1 Cancri	5.9	+2.05	−13.5	+16 02.9	11 16.0	+ 3 07.7	−0.3003	0.5763	−0.1172	+18	−44
B. A. C. 2649	6.3	2.06	13.3	16 46 7	11 54.8	+ 3 45.1	−1.1295	0.5760	0.1182	−36	−73
5 Cancri	6.3	2.07	13.4	16 43.3	13 12.1	+ 4 59.7	−1.2243	0.5755	0.1202	−47	−73
12 Cancri	6.3	2.08	14.5	13 55.3	16 21.9	+ 8 02.7	+1.2747	0.5740	0.1249	+90	+61
27 Cancri	5.6	2.14	15.2	12 58.4	19 0 15.4	− 8 20.7	+1.2264	0.5704	0.1361	+90	+49
29 Cancri	5.9	+2.15	−14.8	+14 31.9	1 04.1	− 7 33.7	−0.4952	0.570ɪ	−0.1372	+ 8	−59
A¹ Cancri	5.6	2.19	15.5	13 01.7	7 33.2	− 1 18.2	+0.1437	0 5670	0.1455	+44	−22
A³ Cancri	5.8	2.19	15.6	12 27.9	9 13.7	+ 0 18.8	+0.4816	0.5662	0.1476	+67	− 3
60 Cancri	5.7	2.23	16.1	11 59.8	13 15.4	+ 4 12.2	+0.3652	0.5644	0.1523	+58	·10
a Cancri	4.3	2.24	16.1	12 14.0	14 24.7	+ 5 19.2	−0.0580	0.5639	0.1537	+31	34
κ Cancri	5.1	+2.26	−16.5	+11 03.5	18 37.1	+ 9 23.0	+0 5084	0 5620	0.1581	+69	3
ω Leonis	5.6	2.31	17 1	9 28.7	20 4 06.5	− 5 26.8	+0 6108	0 5579	0.1672	+78	+ 1
h Leonis	5.4	2.32	17.0	10 08 6	5 43.3	− 3 53.3	− 0.3536	0 5572	0.1686	+16	54
o Leonis	3.8	2.34	17.1	10 20.0	9 59.3	+ 0 14.2	−1.2803	0.5555	0 1720	−53	80
11 Sextantis	6.0	2.39	17.5	8 46.6	17 56.4	+ 7 55.6	−1.0453	0.5525	0.1777	−26	81
π Leonis	5.0	+2.38	−17.6	+ 8 30.6	18 55.7	+ 8 53.0	−0.9411	0 5521	· 0.1783	−19	−81
14 Sextantis	6.6	2.41	18.0	6 05.1	22 03.4	+11 54.5	+1.0427	0.5509	0.1802	+90	+27
16 Sextantis	6.9	2.41	17.9	6 38.8	23 13.0	−10 58.1	+0 2438	0 5505	0.1808	+49	·20
34 Sextantis	6.7	2.47	18.1	4 05.4	21 15 13.1	+ 4 31.1	−0 0164	0.5454	0.1876	+34	−35
35 Sext. (1ˢᵗ star)	6.2	2.48	18.0	5 15.3	15 33.0	+ 4 50.3	−1 3100	0.5453	0.1877	−58	−85
36 Sextantis	6.6	+2.48	−18.2	+ 2 59.9	16 26.9	+ 5 42.6	+0 9061	0 5450	−0.1879	+90	+16
pᴵ³ Leonis	6.2	2.51	18.0	2 29.0	22 3 02.8	− 8 01.5	−0 5505	0 5423	0.1898	+ 5	−72
pᴴ Leonis	5.5	2.53	18.1	+ 0 27.5	6 23.8	+ 4 46.8	+0 9617	0 54 6	0.1901	+90	+19
υ Leonis	4 4	2.57	17.6	− 0 17.3	17 48.8	+ 6 16.9	−0.4127	0 5394	0.1897	+13	−61
B. A. C. 4134	6.0	2.61	16.4	3 24.8	23 14 17.3	+ 2 07.6	0.9064	0 5369	0 1840	·17	−90
B. A. C. 4200	5.7	+2.61	−16.0	− 4 04.7	19 08.1	+ 6 53.2	−1.0810	0.5366	0.1818	−30	90
B. A. C. 4225	6.3	2.62	15.9	4 31.0	21 01.3	+ 8 39 2	−0.9508	0.5364	0.1809	−20	−90
f Virginis	5.9	2.63	15.8	5 17.8	23 35.2	+11 08.3	−0.5740	0.5364	0 1795	+ 2	−74
28 Virginis	7.0	2.64	15.2	6 57.9	24 2 09.9	−10 21.9	+0.7667	0.5362	0.178ɪ	+71	+ 7
B. A..C. 4294	6.1	2.63	15.1	5 46.2	4 58.0	− 7 38.8	−1.0220	0.5362	0.1758	−26	−90
B. A. C. 4394	5.9	+2.65	· 13.9	− 8 27.8	15 26.7	+ 2 30.7	+0.0801	0.5361	−0.1692	+38	−31

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

Name.	Mag.	Red'ns from 1902.0 Δα	Δδ	Apparent Declination.	Washington Mean Time. d h m	Hour Angle, H h m	Y	x'	y'	Limiting Parallels. N.	S.
		s	"	° '		h m				°	°
56 Virginis	7.0	+2.67	-13.5	- 9 51.3	24 18 32.3	+ 5 30.6	+1.0702	0.5361	-0.1668	+80	+29
58 Virginis	7.0	2.67	13.2	10 02.0	19 53.5	+ 6 49.4	+1.0408	0.5361	0.1657	+80	+26
a Virginis	1.2	2.67	12.8	10 39.2	23 44.7	+10 33.5	+1.0834	0.5362	0.1626	+79	+30
h Virginis	5.5	2.65	12.5	9 39.8	25 3 37.7	- 9 40.6	0.6183	0.5365	0.1592	- 2	-79
86 Virginis	6.0	2.67	11.5	11 56.3	10 04.3	- 3 25.8	+0.8555	0.5368	0.1531	+78	+14
λ Virginis	4.7	+2.63	9.4	-12 55.4	26 2 31.4	-11 29.2	0.4473	0.5380	0.1357	+ 5	-64
5 Libræ	6.6	2.60	7.3	15 02.9	15 44.9	+ 1 19.7	+0.1953	0.5393	0.1198	+39	24
a¹ Libræ	5.3	2.60	6.8	15 35.5	18 03.9	+ 3 34.4	+0.5194	0.5395	0.1163	+60	- 6
a² Libræ	2.9	2.60	6.8	15 38.2	18 09.7	+ 3 40.0	+0.5572	0.5395	0.1167	+63	- 4
ν¹ Libræ	5.4	2.56	5.8	15 52.7	27 1 52.6	+11 05.5	-0.0368	0.5406	0.1060	+24	-37
ι² Libræ	6.9	+2.56	- 5.7	-16 06.4	1 58.1	+11 13.9	+0.2043	0.5407	-0.1064	+38	-24
26 Libræ	6.5	2.56	4.9	17 24.3	5 44.1	- 9 07.2	+1.2447	0.5408	0.1013	+73	+52
ι¹ Libræ	5.7	2.50	4.2	16 22.6	12 25.7	2 38.2	0.5360	0.5415	0.0921	- 5	-72
ι² Libræ	7.0	2.51	4.0	17 06.2	13 03.9	- 2 01.2	+0.2096	0.5415	0.0909	+36	-23
ι³ Libræ	6.0	2.49	4.1	16 16.5	13 36.5	- 1 29.6	-0.7556	0.5416	0.0901	-18	-90
ι⁴ Libræ	5.8	+2.48	- 3.9	-16 31.3	14 42.0	- 0 26.2	-0.5802	0.5417	-0.0885	- 8	-77
ν Scorpii	4.2	2.39	- 0.7	19 12.4	28 9 35.2	- 6 08.8	+0.9814	0.5436	0.0602	+71	+24
χ Ophiuchi	5.0	2.30	0.0	18 14.1	16 50.9	+ 0 53.1	-0.4910	0.5442	0.0488	- 7	-68
B. A. C. 5580	5.7	2.26	+ 1.3	19 44.2	23 58.0	+ 7 46.5	+0.8659	0.5448	0.0374	+70	+16
29 Ophiuchi	6.8	2.15	2.2	19 44.4	29 9 33.6	- 6 56.2	-0.5214	0.5454	-0.0218	-11	-72
B. A. C. 6060	6.5	+1.86	+ 5.0	-18 47.0	30 11 22.9	- 5 56.8	-0.4883	0.5464	+0.0208	-10	-68
B. A. C. 6081	6.5	1.86	5.7	20 19.9	13 17.9	- 4 05.5	+1.2628	0.5464	0.0239	+70	+61
B. A. C. 6287	5.7	1.66	6.4	18 47.4	31 3 42.9	+ 9 51.6	+0.0779	0.5466	0.0476	+24	-31
B. A. C. 6294	5.2	1.66	6.3	18 28.1	4 19.1	+10 26.6	-0.2457	0.5466	0.0485	+ 7	-50

APRIL.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time. d h m	Hour Angle, H h m	Y	x'	y'	N.	S.
ρ¹ Sagittarii	3.9	+1.35	+ 7.8	-18 01.8	1 4 16.1	+ 9 37.3	+0.8884	0.5466	+0.0861	+72	+17
ν Sagittarii	4.7	1.34	7.1	16 08.2	4 19.7	+ 9 40.8	-1.1701	0.5466	0.0862	-50	-90
c¹ Sagittarii	5.6	+1.22	+ 7.8	-16 31.0	13 22.5	- 5 33.9	+0.0857	0.5467	+0.0997	+30	-30
c² Sagittarii	5.0	1.22	7.8	16 21.1	14 14.1	- 4 44.0	-0.0065	0.5467	0.1009	+25	-35
B. A. C. 6746	5.5	1.21	7.5	15 41.7	14 44.3	- 4 14.8	-0.6680	0.5467	0.1017	-12	-87
g Sagittarii	5.0	1.13	7.7	15 45.0	21 36.6	+ 2 24.3	+0.1245	0.5468	0.1115	+33	-28
B. A. C. 6992	6.2	0.99	7.8	15 05.5	2 8 30.5	-11 03.0	+0.7105	0.5469	0.1264	+75	+ 5
β Capricorni	3.4	+0.99	+ 7.8	-15 05.3	8 37.3	-10 56.4	+0.7216	0.5469	+0.1266	175	+ 6
B. A. C. 7087	6.2	0.92	7.6	14 03.4	14 55.2	- 4 50.6	+0.4336	0.5473	0.1347	+55	-11
B. A. C. 7221	6.3	0.83	7.2	12 54.4	22 48.0	+ 2 46.8	+0.3013	0.5476	0.1444	+48	-18
B. A. C. 7242	6.5	0.81	6.9	11 56.6	23 57.5	+ 3 54.1	-0.5586	0.5476	0.1458	- 1	-73
ν Aquarii	4.6	0.73	6.9	11 46.0	3 7 48.6	+11 30.0	+0.4344	0.5483	0.1545	+58	-11
17 Aquarii	6.4	+0.68	+ 6.2	- 9 44.1	14 10.7	- 6 20.3	-0.7111	0.5489	+0.1615	- 7	-90
19 Aquarii	5.7	0.66	6.4	10 09.8	15 15.1	5 18.0	-0.0837	0.5490	0.1625	+27	-40
ξ Aquarii	4.8	0.60	5.8	8 17.5	21 12.5	+ 0 27.9	-1.0711	0.5497	0.1683	-31	-90
B. A. C. 7562	5.5	0.57	6.0	9 29.1	4 0 35.4	+ 3 44.1	+0.7595	0.5503	0.1714	+80	+ 7
c¹ Capricorni	5.2	0.57	6.0	9 31.9	0 37.7	+ 3 46.3	+0.8137	0.5503	0.1715	+80	+11
c² Capricorni	6.2	+0.56	-+ 6.1	- 9 43.6	1 13.5	+ 4 21.0	+1.1216	0.5503	+0.1720	+80	+33
30 Aquarii	5.6	0.49	5.1	6 59.7	9 15.9	-11 52.4	0.3334	0.5517	0.1787	+15	-55
B. A. C. 7704	7.3	0.48	5.0	6 18.4	11 20.9	- 9 51.5	-0.7275	0.5521	0.1803	- 6	-90
B. A. C. 7717	6.9	0.47	5.4	8 00.4	12 10.8	- 9 03.2	+1.2471	0.5522	0.1809	+82	+46
44 Aquarii	5.9	0.45	4.7	5 52.5	15 46.2	- 5 34.9	-0.3217	0.5530	0.1835	+17	-54
51 Aquarii	5.8	+0.43	+ 4.6	- 5 19.9	19 03.0	- 2 24.6	-0.2809	0.5536	+0.1856	+19	-52
κ Aquarii	5.5	0.38	4.1	4 43.9	5 1 25.1	+ 2 44.9	+0.2918	0.5551	0.1893	+52	-19
Lalande 44337	6.3	0.37	3.9	4 03.7	2 49.8	+ 5 06.9	-0.1344	0.5556	0.1901	+28	-44
B. A. C. 7951	6.7	0.35	4.0	4 14.2	6 06.0	+ 8 16.5	+1.1854	0.5563	0.1917	+85	+39
Lalande 44872	7.0	0.32	3.6	- 3 46.1	10 23.2	-11 34.9	+1.0100	0.5576	0.1934	+86	+23
κ Piscium	5.0	+0.27	+ 2.2	+ 0 43.2	6 0 02.7	+ 1 37.0	-0.9185	0.5619	+0.1971	-17	89

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

Name.	Mag.	Red'ns from 1902.0 Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	° '
9 Piscium	6.6	+0.27	+ 2.2	+ 0 35.1	6 0 11.4	+ 1 45.4	−0.7520	0.5620	+0.1971	7	−89
				NEW MOON.							
o Arietis	5.8	+0.36	− 3.0	+14 53.8	9 12 13.8	+10 44.7	−0.1214	0.5986	+0.1335	+28	−35
σ Arietis	5.5	0.37	3.6	14 40.6	15 00.2	−10 35.4	+0.4592	0.5994	0.1288	+65	− 2
B. A. C. 1119	6.4	0.50	− 4.9	+16 13.0	10 9 53.5	+ 7 33.2	+1.0408	0.6048	+0.0934	+90	+39
B. A. C. 1206	6.0	0.55	5.1	17 02.1	15 14.4	−11 18.7	+0.6999	0.6059	0.0824	+90	+16
B. A. C. 1240	5.7	0.58	5.1	17 55.0	18 12.3	− 8 27.9	−0.0600	0.6063	0.0762	+39	−19
B. A. C. 1272	6.3	0.60	5.6	17 04.6	21 00.7	− 5 46.2	+1.0999	0.6065	0.0702	+90	+46
ω¹ Tauri	5.8	0.62	5.0	19 20.9	21 25.9	− 5 22.1	−1.1290	0.6066	0.0693	−38	−71
W.B.(2),iv,248	5.9	+0.66	− 5.6	+18 30.4	11 1 48.8	− 1 08.8	−0.0088	0.6069	+0.0598	+35	−21
δ¹ Tauri	4.0	0.65	6.1	17 18.7	2 48.3	− 0 12.6	+1.2386	0.6070	0.0577	+90	+63
B. A. C. 1361	6.5	0.67	5.7	18 48.9	3 34.0	+ 0 31.2	−0.2144	0.6070	0.0560	+23	−33
δ³ Tauri	5.0	0.66	6.0	17 42.1	3 47.5	+ 0 44.2	+0.9057	0.6070	0.0557	+90	+32
ε Tauri	3.6	0.69	5.7	18 57.7	4 59.1	+ 1 52.9	−0.2828	0.6071	0.0529	+19	− 36
B. A. C. 1468	6.3	+0.75	− 6.4	+18 33.3	11 50.6	+ 8 27.8	+0.4320	0.6069	+0.0377	+64	+ 5
i Tauri	5.2	0.78	6.5	18 40.3	13 49.1	+10 21.7	+0.3876	0.6068	0.0333	+60	+ 3
B. A. C. 1563	6.5	0.84	6.7	19 40.2	19 18.3	− 8 22.4	−0.4607	0.6062	0.0210	+ 8	−46
m Tauri	5.1	0.84	7.1	18 30.7	20 02.6	− 7 39.9	+0.7115	0.6061	0.0194	+90	+23
l Tauri	5.4	0.85	6.6	20 17.2	20 10.8	− 7 32.0	−1.0600	0.6061	0.0190	−32	−70
107 Tauri	6.5	+0.85	− 6.8	+19 43.9	20 35.3	− 7 08.5	−0.4963	0.6059	+0.0181	+ 7	−48
B. A. C. 1651	6.5	0.90	7.1	19 42.8	12 1 18.2	− 2 36.9	−0.4191	0.6052	+0.0075	+11	−41
119 Tauri	4.6	0.94	7.8	18 31.2	5 43.5	+ 1 37.8	+0.7885	0.6041	−0.0021	+90	+29
120 Tauri	5.3	0.94	7.9	18 28.1	6 14.4	+ 2 07.5	+0.8381	0.6040	0.0035	+90	+32
B. A. C. 1733	6.3	0.96	7.3	20 24.2	6 15.3	+ 2 08.4	−1.1008	0.6040	0.0035	−35	−70
B. A. C. 1796	7.5	+0.99	− 7.8	+18 56.2	9 44.4	+ 5 29.2	+0.3432	0.6030	−0.0113	+57	+ 3
127 Tauri	6.3	0.99	8.0	18 55.8	9 54.3	+ 5 38.2	+0.3480	0.6030	0.0116	+57	+ 3
Lalande 11088	6.1	1.04	8.1	19 50.4	13 37.5	+ 9 13.0	−0.6250	0.6017	0.0198	− 1	−59
B. A. C. 1867	7.2	1.05	7.9	20 16.4	13 59.0	+ 9 33.7	−1.0669	0.6017	0.0206	−32	−70
χ¹ Orionis	4.6	1.05	8.0	20 15.3	14 24.8	+ 9 58.5	−1.0587	0.6016	0.0215	−31	−70
χ² Orionis	5.8	+1.05	− 8.1	+19 43.7	14 38.0	+10 11.2	−0.5340	0.6015	−0.0220	+ 5	−51
χ³ Orionis	5.1	1.09	8.4	19 41.4	17 59.9	−10 34.9	−0.5818	0.6003	0.0293	+ 2	−56
χ⁴ Orionis	4.8	1.09	8.3	20 08.3	18 10.6	−10 24.6	−1.0387	0.6003	0.0297	−30	−70
68 Orionis	5.6	1.12	8.6	19 48.6	21 24.0	− 7 18.8	−0.8156	0.5990	0.0365	−13	−70
71 Orionis	5.1	1.13	8.9	19 11.2	22 32.3	− 6 13.2	−0.2311	0.5986	0.0390	+22	− 32
Lalande 12148	7.0	1.15	− 9.7	+17 37.2	13 1 44.8	− 3 08.2	+1.2152	0.5973	−0.0457	+90	+60
20 Geminorum	6.3	1.20	9.9	17 50.8	5 32.5	+ 0 30.6	+0.8000	0.5956	0.0535	+90	+25
21 Geminorum	6.5	1.20	9.9	17 51.1	5 32.8	+ 0 30.9	+0.7947	0.5956	0.0535	+90	+25
22 Geminorum	7.2	1.22	9.4	19 30.1	6 27.8	+ 1 23.8	−0.9254	0.5951	0.0554	−20	−70
26 Geminorum	5.0	1.24	10.2	17 44.3	9 37.5	+ 4 26.2	+0.6748	0.5938	0.0617	+89	+17
W.B.(2),vi,1630	5.9	+1.33	−10.7	+17 53.5	17 47.1	−11 42.9	−0.0490	0.5896	− 0.0776	+32	−25
51 Geminorum	5.4	1.37	11.6	16 19.3	22 19.5	− 7 20.7	+1.1771	0.5871	0.0860	+90	+52
λ Geminorum	3.6	1.39	11.5	16 42.8	14 0 16.8	− 5 28.0	+0.6075	0.5860	0.0896	+80	+10
W. 7ʰ 685	5.6	1.47	11.7	17 17.6	5 59.8	+ 0 02.3	−0.5235	0.5829	0.0995	+ 6	-57
67 Geminorum	7.5	1.47	12.3	15 50.8	6 41.7	+ 0 42.7	+0.8850	0.5825	0.1007	+90	+26
68 Geminorum	5.0	+1.46	−12.1	+16 02.0	6 46.7	+ 0 47.5	+0.6844	0.5824	−0.1008	+90	+13
1 Cancri	5.9	1.58	12.7	16 02.9	16 42.9	+10 22.0	−0.4134	0.5766	0.1169	+12	−51
B. A. C. 2649	6.3	1.59	12.6	16 46.8	17 21.6	+10 59.2	1.2394	0.5764	0.1179	−50	74
12 Cancri	6.3	1.61	13.7	13 55.4	21 48.1	− 8 43.8	+1.1598	0.5744	0.1245	+90	+45
27 Cancri	5.6	1.70	14.4	12 58.4	15 5 41.8	− 1 06.9	+1.1157	0.5692	0.1353	+90	+39
29 Cancri	5.9	+1.72	−13.9	+14 31.9	6 30.4	− 0 20.0	−0.6034	0.5687	0.1363	+ 1	68
A¹ Cancri	5.6	1.78	14.6	13 01.7	13 00.6	+ 5 56.6	+0.0378	0.5651	0.1445	+37	−27
A² Cancri	5.8	1.79	14.9	12 27.9	14 41.5	+ 7 34.0	+0.3765	0.5641	0.1464	+59	+10
60 Cancri	5.7	1.83	15.1	11 59.8	18 44.9	+11 29.1	+0.2611	0.5619	0.1510	+51	16
a Cancri	4.3	1.84	15.1	12 14.0	19 54.1	−11 24.0	−0.1596	0.5614	0.1521	+27	−38
κ Cancri	5.1	+1.88	−15.6	+11 03.5	16 0 08.3	− 7 18.5	+0.4086	0.5591	−0.1570	+61	− 9

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

	THE STAR'S				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
ω Leonis	5.6	+1.97	-16.3	+ 9 28.7	16 9 42.4	+ 1 56.4	·+0.5174	0.5543	-0.1654	+69	- 4
h Leonis	5.4	1.98	16.1	10 08.6	11 20.1	+ 3 30.9	-0.4483	0.5535	0.1667	+10	-60
11 Sextantis	6.0	2.09	16.6	8 46.6	23 41.3	- 8 32.1	-1.1348	0.5480	0.1755	-34	-81
π Leonis	5.0	2.10	16.7	8 30.6	17 0 41.3	- 7 34.0	-1.0296	0.5476	0.1761	-25	-81
14 Sextantis	6.6	2.13	17.4	6 05.1	3 51.4	- 4 30.1	+0.9649	0.5464	0.1779	+90	+21
16 Sextantis	6.9	+2.14	-17.2	+ 6 38.8	5 01.7	- 3 22.0	+0.1638	0.5459	-0.1785	+44	-25
34 Sextantis	6.7	2.28	17.7	4 05.4	21 15.4	-11 39.1	-0.0857	0 5404	0.1850	+30	-39
36 Sextantis	6.6	2.29	17.9	2 59.9	22 30.2	-10 26.6	+0.8430	0.5401	0.1854	+90	+12
ρ³ Leonis	6.2	2.37	17.7	2 29.0	18 9 15.6	- 0 01.3	-0.6130	0.5374	0.1873	+ 1	-77
ρ⁶ Leonis	5.5	2.40	18.1	+ 0 27.5	12 39.5	+ 3 16.4	+0.9109	0.5367	0.1876	+90	+16
ν Leonis	4.4	+2.49	-17.6	- 0 17.3	19 0 14.6	- 9 29.9	-0.4615	0.5349	-0.1872	+10	-64
B. A. C. 4134	6.0	2.63	16.8	3 24.8	20 59.7	+10 37.4	-0.9398	0.5332	0.1819	-18	-90
B. A. C. 4200	5.7	2.66	16.5	4 04.7	20 1 54.0	- 8 37.2	-1.1104	0.5332	0.1797	-32	-90
B. A. C. 4225	6.3	2.68	16.4	4 31 0	3 48.6	- 6 46.1	-0.9788	0.5332	0.1789	-22	-90
f Virginis	5.9	2.70	16.3	5 17.8	6 24.3	- 4 14.9	-0.5972	0.5332	0.1776	+ 1	-76
28 Virginis	7.0	+2.73	-16.2	- 6 57.9	9 00 6	- 1 43.4	+0.7520	0.5332	-0.1762	+83	+ 6
B. A. C. 4294	6.1	2.74	15.9	5 46.2	11 50.5	+ 1 01.3	-1.0441	0.5334	0.1748	-27	-90
B. A. C. 4394	5.9	2.81	15.0	8 27.8	22 25.1	+11 16.8	+0.0727	0.5339	0.1677	+37	-31
56 Virginis	7.0	2.84	14.8	9 51.3	21 1 32.2	- 9 41.8	+1.0703	0.5342	0.1654	+80	+29
58 Virginis	7.0	2.85	14.6	10 02.0	2 54.0	- 8 22.5	+1.0413	0.5343	0.1644	+80	+27
a Virginis	1.2	+2.87	-14.2	-10 39.2	6 47.1	- 4 36.5	+1.0866	0.5347	-0.1613	+79	+30
h Virginis	5.5	2.87	13.7	9 39.8	10 41.7	- 0 49.0	-0.6194	0.5351	0.1580	- 3	-82
86 Virginis	6.0	2.92	13.0	11 56.4	17 10.5	+ 5 27.9	+0.8648	0.5358	0.1522	+78	+14
λ Virginis	4.7	2.97	10.8	12 55.4	22 9 41.8	- 2 31.1	-0.4321	0.5381	0.1352	+ 6	-62
5 Libræ	6.6	3.01	8.8	15 02.9	22 56.7	+10 19.2	+0.2202	0.5400	0.1194	+40	-23
a¹ Libræ	5.3	+3.03	- 8.4	-15 35.5	23 1 15.9	-11 26.0	+0.5459	0.5403	-0.1165	+63	- 3
a² Libræ	2.9	3.03	8.4	15 38.2	1 21.7	-11 20.4	+0.5840	0.5404	0.1163	+65	- 2
ν¹ Libræ	5.4	3.03	7.2	15 52.8	9 04.7	- 3 51.8	-0.0076	0.5415	0.1063	+25	-36
ν³ Libræ	6.9	3.03	7.2	16 06.4	9 10.2	- 3 46.4	+0.2344	0.5416	0.1061	+39	-22
26 Libræ	6.5	3.06	6.4	17 24.3	12 56.3	- 0 07.4	+1.2783	0.5422	0.1010	+73	+59
ζ¹ Libræ	5.7	+3.02	- 5.5	-16 22.6	19 37.7	+ 6 21.4	-0.5030	0.5430	-0.0916	- 3	-69
ζ² Libræ	7.0	3.03	5.3	17 06.3	20 15.8	+ 6 58.3	-0.2443	0.5431	0.0907	+37	-22
ζ³ Libræ	6.0	3.01	5.3	16 16.5	20 48.3	+ 7 29.8	-0.7228	0.5431	0.0900	-16	-90
ζ⁴ Libræ	5.8	3.02	5.2	16 31.3	21 53.7	+ 8 33.1	-0.5460	0.5433	0.0884	- 6	-74
ν Scorpii	4.2	3.01	1.7	19 12.4	24 16 45.8	+ 2 49.5	+1.0248	0.5453	0.0601	+71	+28
χ Ophiuchi	5.0	+2.95	- 0.8	·-18 14.1	25 0 01.0	+ 9 50.8	-0.4478	0.5458	-0.0487	- 5	-65
B. A. C. 5580	5.7	2.95	+ 0.7	19 44.2	7 07.8	- 7 16.0	+0.9131	0.5462	0.0373	+70	+20
29 Ophiuchi	6.8	2.86	1.8	18 44.5	16 43.5	+ 2 01.2	-0.4755	0.5466	-0.0217	- 9	-67
B. A. C. 6060	6.5	2.64	5.6	18 46.9	26 18 36.1	+ 3 04.0	-0.4400	0.5463	+0.0208	- 7	-64
B. A. C. 6287	5.7	2.48	7.7	18 47.3	27 11 02.1	- 5 01.5	+0.1285	0.5454	0.0474	+28	-27
B. A. C. 6294	5.2	+2.47	+ 7.6	-18 28.1	11 38.6	- 4 26.2	-0.1968	0.5454	+0.0483	+10	-47
ρ¹ Sagittarii	3.9	2.18	9.9	18 01.8	28 11 50.9	- 5 00.3	+0.9432	0 5434	0.0855	+72	+21
υ Sagittarii	4.7	2.18	9.2	16 08.2	11 54.6	- 4 56.6	-1.1303	0.5432	0.0856	-46	-90
e¹ Sagittarii	5.6	2.05	10.2	16 30.9	21 05.4	+ 3 56.7	+1.1337	0.5426	0.0988	+36	-27
e² Sagittarii	5.0	2.04	10.1	16 21.1	21 57.8	+ 4 47.4	+0.0405	0.5425	0.1001	+27	-33
B. A. C. 6746	5.5	+2.03	+10.0	-15 41.7	22 28.5	+ 5 17.1	-0.6259	0.5425	+0.1008	- 9	-81
g Sagittarii	5.0	1.94	10.5	15 44.9	29 5 27.7	-11 56.9	+0.1713	0.5421	0.1104	+38	-24
B. A. C. 6992	6.2	1.80	10.9	15 05.5	16 33.8	- 1 11.9	+0.7604	0.5413	0.1249	+75	+ 8
β Capricorni	3.4	1.80	10.9	15 05.3	16 40.8	- 1 05.1	+0.7718	0.5413	0.1251	+75	+ 9
B. A. C. 7087	6.2	1.71	10.8	14 03.3	23 06.5	+ 5 08.5	+0.4798	0.5412	0.1330	+58	- 8
B. A. C. 7221	6.3	+1.61	+10.7	-12 54.3	30 7 09.6	-11 03.7	+0.3446	0.5410	+0.1425	+51	-16
B. A. C. 7242	6.5	1.59	10.4	11 56.5	8 20.8	- 9 54.8	-0.5240	0.5411	0.1438	+ 1	-70
ν Aquarii	4.6	1.49	10.4	11 45.9	16 22.7	- 2 08.1	+0.4771	0.5413	0.1525	+61	- 9
14 Aquarii	6.9	1.45	9.6	9 37.2	19 40.3	+ 1 03.3	-1.3141	0.5414	0.1558	-64	-90
17 Aquarii	6.4	1.41	9.7	9 44.1	22 53.9	+ 4 10.8	-0.6824	0.5416	0.1591	- 6	-87
19 Aquarii	5.7	+1.39	+ 9.9	-10 09.8	23 59.9	+ 5 14.6	-0.0486	0.5417	+0.1601	+29	-38

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

Name.	Mag.	Red'ns from 1902.0 Δα	Δδ	Apparent Declination	Washington Mean Time	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m			•	°	°
ξ Aquarii	4.8	+1.33	+ 9.4	− 8 17.5	1 6 06.0	+11 09.3	−1.0484	0.5422	+0.1658	−29	−90
B. A. C. 7652	5.5	1.29	9.8	9 29.1	9 34.0	− 9 29.3	+0.8007	0.5426	0.1688	+80	+10
c¹ Capricorni	5.2	1.28	9.8	9 31.8	9 36.3	− 9 27.1	+0.8554	0.5427	0.1688	+80	+13
c² Capricorni	6.2	1.28	9.9	9 43.5	10 13.0	− 8 51.5	+1.1664	0.5427	0.1694	+80	+37
30 Aquarii	5.6	1.18	8.8	6 59.6	18 27.4	− 0 52.9	−0.3051	0.5427	0.1759	+17	−53
B. A. C. 7690	7.0	+1.17	+ 8.3	− 5 49.8	19 48.9	+ 0 26.1	−1.2949	0.5443	+0.1769	−55	−90
B. A. C. 7704	7.3	1.16	8.5	6 18.3	20 35.5	+ 1 11.1	−0.6549	0.5444	0.1775	− 2	−83
B. A. C. 7717	6.9	1.15	9.1	8 00.4	21 26.5	+ 2 00.5	+1.2895	0.5445	0.1781	+82	+53
44 Aquarii	5.9	1.11	8.3	5 52.5	2 1 07.3	+ 5 34.2	−0.2963	0.5455	0.1805	+18	−53
51 Aquarii	5.8	1.08	8.0	5 19.9	4 28.9	+ 8 49.3	−0.2560	0.5460	0.1827	+20	−50
κ Aquarii	5.5	+1.01	+ 7.7	− 4 43.9	11 00.1	− 8 52.1	+0.3202	0.5477	+0.1865	+54	−17
Lalande 44337	6.3	1.00	7.4	4 03.6	12 26.7	− 7 28.3	−0.1108	0.5481	0.1872	+28	−41
B. A. C. 7951	6.7	0.96	7.5	4 44.1	15 47.5	− 4 14.0	+1.2205	0.5490	0.1889	+85	+42
Lalande 44872	7.0	0.92	7.0	− 3 46.0	20 10.4	+ 0 00.3	+1.0415	0.5504	0.1907	+86	+26
κ Piscium	5.0	0.81	5.0	+ 0 43.2	3 10 06.8	−10 30.8	−0.9071	0.5555	0.1946	−16	−89
9 Piscium	6.6	+0.81	+ 5.1	+ 0 35.1	10 15.7	−10 22.2	−0.7393	0.5556	+0.1946	− 6	−85
15 Piscium	6.6	0.78	5.0	0 46.4	14 03.8	− 6 41.8	−0.1903	0.5572	0.1951	+25	−46
16 Piscium	5.6	0.78	4.7	1 33.6	14 29.3	− 6 17.1	−0.9140	0 5574	0.1951	−17	−88
λ Piscium	4.7	0.75	4.7	1 14.5	17 05.1	− 3 46.5	−0.0807	0.5586	0.1952	+30	−40
21 Piscium	6.1	0.72	4.6	0 32.0	20 27.7	− 0 30.7	+1.3017	0.5602	0.1953	+90	+51
22 Piscium	5.9	+0.73	+ 4.1	+ 2 23.2	21 36.1	+ 0 35.3	−0.3683	0.5608	+0.1952	+15	−57
25 Piscium	6.3	0.72	4.3	1 32.8	22 06.6	+ 1 04.7	+0.5881	0.5609	0.1952	+75	− 3
51 Piscium	5.7	0.62	2.1	6 24.9	4 15 41.2	− 5 56.9	−0.9439	0.5702	0.1912	−19	−84
60 Piscium	6.2	0.57	1.6	6 12.4	22 14.6	+ 0 22.6	+0.5102	0.5740	0.1880	+68	− 6
62 Piscium	6.0	0.57	1.5	6 45.9	22 37.5	+ 0 44.5	+0.0204	0.5742	0.1878	+36	−33
δ Piscium	4.8	+0.57	+ 1.4	+ 7 03.1	22 47.8	+ 0 54.5	−0.2356	0.5743	+0.1877	+22	−47
ε Piscium	4.5	0.57	+ 0.9	7 21.8	5 4 57.0	+ 6 50.4	+0.5959	0.5780	0.1838	+76	0

NEW MOON.

B. A. C. 1468	6.3	+0.57	− 6.9	+18 33.3	8 21 03.5	− 4 31.4	+0.4287	0.6171	+0.0383	+63	+ 5
i Tauri	5.2	+0.58	− 7.0	+18 40.3	22 58.2	− 2 41.3	+0.3845	0.6171	0.0339	+60	+ 3
B. A. C. 1563	6.5	0.62	7.2	19 40.2	9 4 17.0	+ 2 24.2	−0.4505	0.6168	0.0211	+10	−45
m Tauri	5.1	0.61	7.5	18 30.7	5 00.0	+ 3 05.4	+0.7042	0.6168	0.0198	+90	+23
l Tauri	5.4	0.63	7.2	20 17.2	5 07.9	+ 3 13.0	−1.0410	0.6168	0.0195	−30	−70
107 Tauri	6.5	0.62	7.3	19 43.8	5 31.6	+ 3 35.7	−0.4858	0.6167	0.0186	+ 7	−47
B. A. C. 1651	6.5	+0.65	− 7.6	+19 42.8	10 05.3	+ 7 58.1	−0.4089	0.6160	+0.0078	+12	−41
119 Tauri	4.6	0.67	8.1	18 31.2	14 21.8	−11 56.0	+0.7809	0.6152	−0.0023	+90	+29
120 Tauri	5.3	0.67	8.1	18 28.1	14 51.7	−11 27.4	+0.8293	0.6151	0.0034	+90	+31
B. A. C. 1733	6.3	0.69	7.8	20 24.2	14 52.4	−11 26.6	−1.0792	0.6150	0.0034	−33	−70
B. A. C. 1796	7.5	0.70	8.2	18 56.2	18 14.7	− 8 12.7	+0.3430	0.6142	0.0113	+57	+ 3
127 Tauri	6.3	+0.70	− 8.3	+18 55.8	18 24.2	− 8 03.6	+0.3473	0.6141	−0.0117	+57	+ 3
Lalande 11088	6.1	0.73	8.4	19 50.4	21 59.9	− 4 36.8	−0.0699	0.6130	0.0200	− 1	−58
B. A. C. 1867	7.2	0.74	8.3	20 16.4	22 20.7	− 4 16.8	−1.0447	0.6129	0.0208	−30	−70
χ¹ Orionis	4.6	0.74	8.3	20 15.3	22 45.5	− 3 53.1	−1.0365	0.6127	0.0218	−29	−70
χ² Orionis	5.8	0.74	8.5	19 43.7	22 58.4	− 3 40.6	−0.5196	0.6127	0.0222	+ 6	−50
χ³ Orionis	5.1	+0.76	− 8.7	+19 41.4	10 2 13.5	− 0 33.6	−0.5666	0.6115	−0.0297	+ 3	−55
χ⁴ Orionis	4.8	0.77	8.6	20 08.3	2 23.7	0 23.8	−1.0162	0.6114	0.0301	−28	−70
68 Orionis	5.6	0.79	8.8	19 48.6	5 30.6	+ 2 35.5	−0.7962	0.6102	0.0371	−11	−70
71 Orionis	5.1	0.79	9.1	19 11.2	6 36.6	+ 3 38.8	−0.2207	0.6097	0.0396	+22	+31
Lalande 12148	7.0	0.81	9.6	17. 37.2	9 42.5	+ 6 37.2	+1.2029	0.6083	0.0464	+10	−72
20 Geminorum	6.3	+0.84	− 9.8	+17 50.8	13 22.6	+10 08.4	+0.7950	0.6065	−0.0544	+90	+25
21 Geminorum	6.5	0.84	9.8	17 51.1	13 22.9	+10 08.7	+0.7897	0.6065	0.0544	+90	+25
22 Geminorum	7.2	0.86	9.4	19 30.1	14 16.1	+10 59.7	−0.9030	0.6060	0.0562	−18	−70
26 Geminorum	5.0	0.87	10.0	17 44.3	17 19.4	−10 04.3	+0.6724	0.6044	0.0627	+89	+17
W.B.(2),vi,1630	5.9	0.95	10.4	17 53.5	11 1 12.9	− 2 29.4	−0.0386	0.5998	0.0788	+33	−24
51 Geminorum	5.4	+0.98	−11.2	+16 19.3	5 36.6	+ 1 44.0	+1.1704	0.5971	−0.0872	+90	+51

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

		THE STAR'S			AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1902.0		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° '	d h m	h m				°	°
λ Geminorum	3.6	+1.00	−11.1	+16 42.8	11 7 30.3	+ 3 33.2	+0.6090	0.5958	−0.0908	+80	+10
W. 7ʰ 685	5.6	1.06	11.2	17 17.6	13 02.7	+ 8 52.8	−0.5050	0.5922	0.1009	+ 7	−56
67 Geminorum	7.5	1.06	11.7	15 50.8	13 43.4	+ 9 32.1	+0.8839	0.5918	0.1021	+90	+26
68 Geminorum	5.0	1.06	11.6	16 02.0	13 48.2	+ 9 36.7	+0.6864	0.5917	0.1023	+90	+13
1 Cancri	5.9	1.15	11.9	16 02.9	23 27.2	− 5 06.1	−0.3939	0.5850	0.1183	+13	−50
B A. C. 2649	6.3	+1.17	−11.7	+16 46.8	12 0 04.8	− 4 30.1	−1.2089	0.5846	−0.1194	−45	−73
12 Cancri	6.3	1.20	12.7	13 55.4	4 24.1	− 0 20.3	+1.1590	0.5816	0.1260	+90	+45
27 Cancri	5.6	1.27	13.4	12 58.5	12 05.8	+ 7 04.7	+1.1178	0.5760	0.1368	+90	+40
29 Cancri	5.9	1.29	12.8	14 31.9	12 53.2	+ 7 50.2	−0.5801	0 5756	0.1379	+ 3	−66
A¹ Cancri	5.6	1.34	13.4	13 01.7	19 14.6	−10 01.9	+0.0541	0.5712	0.1459	+39	−27
A² Cancri	5.8	+1.35	−13.7	+12 28.0	20 53.2	− 9 26.9	+0.3910	0.5700	−0.1478	+60	− 8
60 Cancri	5.7	1.40	13.9	11 59.8	13 0 51.5	− 4 36.9	+0.2770	0.5673	0.1523	+52	−15
α Cancri	4.3	1.42	13.9	12 14.0	1 59.4	− 3 31.4	−0.1398	0.5665	0.1536	+27	−39
κ Cancri	5.1	1.46	14.4	11 03.5	6 08.7	+ 0 29.4	+0.4235	0.5638	0.1578	+62	− 8
ω Leonis	5.6	1.56	15.0	9 28.8	15 33.3	+ 9 34.8	+0.5333	0.5579	0.1664	+70	− 2
h Leonis	5.4	+1.59	−14.7	+10 08.6	17 09.6	+11 07.8	−0.4243	0.5569	−0.1677	+12	−58
11 Sextantis	6.0	1.70	15.1	8 46.7	14 5 21.7	− 1 04.3	−1.1057	0.5500	0.1761	−32	−81
π Leonis	5.0	1.73	15.2	8 30.6	6 21.1	− 0 06.9	−1.0012	0.5495	0.1767	−23	−81
14 Sextantis	6.6	1.77	16.0	6 05.1	9 29.4	+ 2 55.3	+0.9814	0.5479	0.1783	+90	+23
34 Sextantis	6.7	1.95	16.3	4 05.4	15 2 47.2	− 4 19.9	−0.0621	0.5403	0.1849	+32	−38
36 Sextantis	6.6	+1.95	−16.6	+ 2 59.9	4 01.9	− 3 07.5	+0.8633	0.5398	−0.1853	+90	+13
p³ Leonis	6.2	2.07	16.4	2 29.0	14 46.4	+ 7 16.9	−0.5885	0.5362	0.1869	+ 3	−75
p⁵ Leonis	5.5	2.13	16.9	+ 0 27.5	18 10.5	+10 34.8	+0.9327	0.5353	0.1871	+90	+18
ν Leonis	4.4	2.24	16.5	− 0 17.2	16 5 47.3	− 2 09.7	−0.4389	0.5326	0.1865	+11	−63
B. A. C. 4134	6.0	2.48	16.0	3 24.8	17 2 39.5	− 5 55.4	−0.9217	0.5301	0.1810	−18	−90
B. A. C. 4200	5.7	+2.53	−15.7	− 4 04.6	7 36.0	− 1 07.9	−1.0940	0.5299	−0.1789	−31	−90
B. A. C. 4225	6.3	2.55	15.7	4 31.0	9 31.5	+ 0 44.3	−0.9625	0.5299	0.1780	−19	−90
f Virginis	5.9	2.57	15.7	5 17.8	12 08.5	+ 3 16.6	−0.5812	0.5299	0.1768	+ 2	−74
28 Virginis	7.0	2.60	15.8	6 57.9	14 46.0	+ 5 49.3	+0.7699	0.5299	0.1754	+73	+ 7
B. A. C. 4294	6.1	2.64	15.3	5 46.2	17 37.3	+ 8 35.5	−1.0294	0.5300	0.1738	−24	−90
B. A. C. 4394	5.9	+2.76	−14.8	− 8 27.8	18 4 17.5	− 5 03.4	+0.0858	0.5309	−0.1670	+38	−30
56 Virginis	7.0	2.81	14.7	9 51.3	.7 26.2	− 2 00.4	+1.0846	0.5309	0.1647	+80	+30
58 Virginis	7.0	2.83	14.6	10 02.0	8 48.7	− 0 40.4	+1.0556	0.5311	0.1637	+80	+28
α Virginis	1.2	2.87	14.2	10 39.2	12 43.7	+ 3 07 6	+1.1000	0.5314	0.1607	+79	+31
h Virginis	5.5	2.89	13.5	9 39.7	16 40.5	+ 6 57.2	−0.6121	0.5320	0.1574	− 1	−78
86 Virginis	6.0	+2.96	−13.3	−11 56.4	23 12.7	−10 42.4	+0.8737	0.5328	−0.1514	+78	+17
λ Virginis	4.7	3.10	11.0	12 55.4	19 15 51.6	+ 5 26.1	−0.4332	0.5357	0.1350	+ 6	−63
5 Libræ	6.6	3.21	9.3	15 03.0	20 5 11.7	− 5 38.3	+0.2147	0.5383	0.1195	+40	−23
a¹ Libræ	5.3	3.23	8.9	15 35.6	7 31.6	− 3 22.8	+0.5403	0.5387	0.1166	+62	− 5
a² Libræ	2.9	3.23	8.9	15 38.2	7 37.3	− 3 17.2	+0.5786	0.5388	0.1165	+65	− 3
ν¹ Libræ	5.4	+3.28	− 7.6	−15 52.8	15 22.9	+ 4 13.9	−0.0188	0.5402	−0.1065	+25	−36
ν² Libræ	6.9	3.28	7.6	16 06.4	15 28.3	+ 4 19.2	+0.2239	0.5403	0.1064	+39	−23
26 Libræ	6.5	3.34	7.0	17 24.3	19 15.3	+ 7 59.2	+1.2683	0.5410	0.1013	+73	+57
ζ¹ Libræ	5.7	3.33	5.8	16 22.6	21 1 58.2	− 9 30.6	−0.5203	0.5423	0.0921	− 4	−71
ζ² Libræ	7.0	3.34	5.7	17 06.3	2 36.5	− 8 53.5	+0.2281	0.5424	0.0911	+37	−22
ζ³ Libræ	6.0	+3.33	− 5.6	−16 16.5	3 09.1	− 8 21.9	−0.7408	0.5425	−0.0904	−17	−90
ζ⁴ Libræ	5 8	3.34	5.5	16 31.3	4 14.7	− 7 18.4	−0.5647	0.5427	0.0888	− 7	−75
ν Scorpii	4.2	3.44	2.1	19 12.4	23 08.7	+11 00.0	+0.9985	0.5457	0.0607	+71	+26
χ Ophiuchi	5.0	3.43	− 0.8	18 14.1	22 6 24.3	− 5 58.3	−0.4810	0.5465	0.0494	− 6	−68
B. A. C. 5580	5.7	3.44	+ 0.5	19 44.2	13 31.2	+ 0 54.9	+0.8783	0.5472	0.0379	+70	+17
29 Ophiuchi	6.8	+3.40	+ 2.1	−18 44.5	23 06.4	+10 11.7	−0.5181	0.5478	−0.0223	−12	−71
B. A. C. 6060	6.5	3.30	6.6	18 46.9	24 0 57.3	+11 12.6	−0.4980	0.5478	+0.0203	−11	−69
B. A. C. 6081	6.5	3.32	7.1	20 19.8	2 52.8	−10 55.5	+1.2630	0.5476	0.0234	+71	+61
B. A. C. 6287	5.7	3.18	9.3	18 47.3	17 22.9	+ 3 06.8	+0.0621	0.5465	0.0469	+23	−32
B. A. C. 6294	5.2	3.18	9.2	18 28.1	17 59.3	+ 3 42.0	−0.2645	0.5465	0.0479	+ 6	−51
ρ¹ Sagittarii	3.9	+2.96	+12.4	−18 01.7	18 14.5	+ 3 10.9	+0.8665	0.5434	+0.0850	+72	+16

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

Name.	Mag.	Red'ns from 1902.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	Limiting Parallels. N.	S.
		s	"	° '	d h m	h m				°	°
ν Sagittarii	4.7	+2.94	+12.0	−16 08.2	24 18 18.2	+ 3 14.5	−1.2159	0.5434	+0.0851	−56	−90
e¹ Sagittarii	5.6	2.86	13.1	16 30.9	25 3 31.7	−11 49.5	+0.0489	0.5421	0.0983	+28	−32
e² Sagittarii	5.0	2.85	13.1	16 21.0	26 4 24 3	−10 58.6	−0.0452	0.5419	0.0995	+23	−38
B. A. C. 6746	5.5	2.84	12.9	15 41.7	4 55.3	−10 28.6	−0.7154	0.5418	0.1002	−15	−90
g Sagittarii	5.0	2.76	13.5	15 44.9	11 57.4	− 3 39.7	+0.0828	0.5409	0.1097	+31	−30
B. A. C. 6992	6.2	+2.62	+14.2	−15 05.4	23 09.6	+ 7 11.4	+0.6714	0.5393	+0.1241	+73	+ 3
β Capricorni	3.4	2.62	14.3	15 05.2	23 16.6	+ 7 18.2	+0.6825	0.5393	0.1242	+73	+ 3
B. A. C. 7087	6.2	2.53	14.4	14 03.2	27 5 46.7	−10 23.8	+0.3858	0.5385	0.1320	+52	−14
B. A. C. 7221	6.3	2.44	14.6	12 54.2	13 56.3	− 2 29.4	+0.2471	0.5377	0.1413	+44	−21
B. A. C. 7242	6.5	2.42	14.3	11 56.4	15 08.5	− 1 19.5	−0.6295	0.5376	0.1425	− 4	−81
ν Aquarii	4.6	+2.32	+14.6	−11 45.9	23 18.1	+ 6 34.9	+0.3781	0.5371	+0.1510	+54	−14
17 Aquarii	6.4	2.24	14.1	9 44.0	28 5 56.4	−10 59.1	−0.7944	0.5368	0.1574	−13	−90
19 Aquarii	5.7	2.22	14.3	10 09.7	7 03.7	− 9 53.9	−0.1544	0.5368	0.1584	+23	·44
ξ Aquarii	4.8	2.15	13.9	8 17.4	13 17.1	− 3 52.0	−1.1663	0.5368	0.1639	−40	−90
B. A. C. 7562	5.5	2.11	14.4	9 29.0	16 49.4	− 0 26.3	+0.7022	0.5369	0.1668	+80	+ 4
c¹ Capricorni	5.2	+2.11	+14.4	− 9 31.7	16 51.9	− 0 23.9	+0.7579	0.5369	+0.1669	+80	+ 7
c² Capricorni	6.2	2.10	14.4	9 43.5	17 29.4	+ 0 12.5	+1.0723	0.5369	0.1674	+80	+29
30 Aquarii	5.6	2.02	13.5	6 59.5	29 1 55.2	+ 8 22.6	−0.4179	0.5374	0.1737	+11	−61
B. A. C. 7704	7.3	1.97	13.2	6 18.2	4 06.3	+10 29.6	−0.7710	0.5376	0.1752	− 9	−90
B. A. C. 7717	6.9	1.96	13.8	8 00.3	4 58.7	+11 20.4	+1.1969	0.5377	0.1758	+82	+40
44 Aquarii	5.9	+1.92	+13.0	− 5 52.4	8 45.0	− 9 00.4	−0.4085	0.5381	+0.1782	+12	−60
51 Aquarii	5.8	1.88	12.8	5 19.8	12 11.9	− 5 39.9	−0.3674	0.5386	0.1803	+14	−57
κ Aquarii	5.5	1.80	12.6	4 43.8	18 53.6	+ 0 49.2	−0.2165	0.5398	0.1839	+47	−23
Lalande 44337	6.3	1.79	12.3	4 03.6	20 22.7	+ 2 15.5	−0.2196	0.5401	0.1846	+22	−48
B. A. C. 7951	6.7	1.75	12.4	4 44.0	23 49.0	+ 5 35.3	+1.1293	0.5409	0.1861	+85	+33
Lalande 44872	7.0	+1.70	+11.9	− 3 45.9	30 4 19.5	+ 9 57.2	+0.9493	0.5420	+0.1879	+86	+19
κ Piscium	5.0	1.57	9.6	+ 0 43.3	18 40.9	− 0 08.8	−1.0219	0.5465	0.1916	−24	−89
9 Piscium	6.6	1.56	9.6	0 35.2	18 49.9	− 0 00.1	−0.8514	0.5466	0.1917	−13	−89
15 Piscium	6.6	1.52	9.6	0 46.5	22 45.0	+ 3 47.3	−0.2941	0.5480	0.1922	+19	−53
16 Piscium	5.6	1.53	9.3	1 33.7	23 11.3	+ 4 12.8	−1.0275	0.5482	0.1922	−25	88
λ Piscium	4.7	+1.49	+ 9.3	+ 1 14.6	31 1 51.9	+ 6 48.2	−0.1815	0.5490	+0.1923	+25	−45
21 Piscium	6.1	1.45	9.3	0 32.1	5 20.8	+10 10.2	+1.2213	0.5509	0.1924	+87	+43
22 Piscium	5.9	1.45	8.5	2 23.3	6 31.3	+11 18.5	−0.4707	0.5514	0.1924	+10	−69
25 Piscium	6.3	+1.44	+ 8.8	+ 1 32.9	7 02.7	+11 48.8	+0.4988	0.5516	+0.1924	+67	− 8

JUNE.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
51 Piscium	5.7	+1.28	+ 5.8	+ 6 24.9	1 1 09.1	+ 5 19.0	−1.0423	0.5610	+0.1887	−26	−84
60 Piscium	6.2	1.22	5.4	6 12.5	7 53.8	+11 49.8	+0.4345	0.5650	0.1858	+63	−10
62 Piscium	6.0	+1.23	+ 5.2	+ 6 46.0	8 17.4	−11 47.4	−0.0604	0.5653	+0.1856	+32	−37
δ Piscium	4.8	1.23	5.1	7 03.2	8 27.9	−11 37.3	−0.3196	0.5654	0.1855	+18	−53
ε Piscium	4.5	1.17	4.5	7 21.8	14 47.3	− 5 31.2	+0.5266	0.5694	0.1818	+70	− 5
π Piscium	5.5	1.08	2.0	11 38.5	2 5 31.9	+ 8 41.8	−1.1830	0.5793	0.1700	−40	−78
B. A. C. 490	7.5	1.08	2.0	11 34.7	5 46.3	+ 9 05.6	−1.0786	0.5795	0.1698	−30	−78
54 Ceti	5.5	+1.02	+ 1.7	+10 33.5	11 21.1	− 9 41.8	+0.8753	0.5834	+0.1640	+90	+19
B. A. C. 609	6.2	1.00	+ 1.0	11 49.2	14 54.9	− 6 16.0	+0.1919	0.5859	0.1600	+46	−20
29 Arietis	6.3	0.94	− 0.9	14 36.0	3 4 35 0	+ 6 53.2	−0.5053	0.5956	0.1415	+ 7	−60
o Arietis	5.8	0.90	1.5	14 53.8	9 14.8	+11 22.1	−0.1530	0.5987	0.1346	+26	−36
σ Arietis	5.5	0.88	1.7	14 40.7	12 00.4	− 9 58.8	+0.4282	0.6007	+0.1301	+63	− 4
				NEW MOON.							
20 Geminorum	6.3	+0.76	− 9.6	+17 50.8	6 23 18.2	− 2 07.9	+0.8565	0.6154	−0.0540	+90	+29
21 Geminorum	6.5	0.76	9.6	17 51.1	23 18.5	− 2 07.7	+0.8514	0.6153	0.0540	+90	+29
22 Geminorum	7.2	0.77	9.4	19 30.1	7 0 10.3	− 1 18.0	−0.8197	0.6150	0.0559	−13	−70
26 Geminorum	5.0	+0.78	− 9.8	+17 44.3	3 08.5	+ 1 32.9	+0.7400	0.6137	−0.0626	+90	+21

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

Name.	Mag.	Red'ns from 1902.0 Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° ′	d h m	h m				°	°
W.B.(2)vi,1630	5.9	+0.80	−10.2	+17 53.5	7 10 48.4	8 54.1	+0.0467	0.6097	−0.0790	+38	−19
51 Geminorum	5.4	0.83	10.6	16 19.3	15 04.0	11 00.6	+1.2440	0.6073	0.0877	+90	+61
λ Geminorum	3.6	0.83	10.6	16 42.9	16 54.2	9 15.0	+0.6924	0.6061	0.0914	+90	+15
W. 7ʰ 685	5.6	0.87	10.7	17 17.6	22 16.2	− 4 05.7	−0.4002	0.6028	0.1017	+13	−48
67 Geminorum	7.5	0.87	11.1	15 50.8	22 55.5	− 3 27.9	+0.9696	0.6023	0.1030	+90	+32
68 Geminorum	5.0	+0 87	−11.0	+16 02.1	23 00.1	− 3 23.5	+0.7750	0.6022	−0.1031	+90	+19
1 Cancri	5.9	0.93	11.3	16 02.9	8 8 20.1	5 35.5	−0.2799	0.5956	0.1196	+20	−42
B.A.C. 2649	6.3	0.94	11.3	16 46 6	8 56.5	6 09.7	−1.0815	0.5953	0.1207	−34	−73
5 Cancri	6.3	0.94	11.2	16 43.3	10 09.0	7 19.4	−1.1722	0.5945	0.1227	−41	−73
12 Cancri	6.3	0.96	11.9	13 55.4	13 07.2	10 10.8	+1.2548	0.5923	0.1274	+90	+58
27 Cancri	5.6	+1.01	−12.3	+12 58.5	20 33.4	− 6 39.9	+1.2208	0.5865	−0.1385	+90	+51
29 Cancri	5.9	1.02	12.0	14 31.9	21 19.3	− 5 55.8	−0.4501	0.5862	0.1396	+10	−56
A¹ Cancri	5.6	1.07	12.4	13 01.7	9 3 27.7	− 0 01.0	+0.1804	0.5816	0.1478	+46	−29
A² Cancri	5.8	1.08	12.6	12 28.0	5 03.1	+ 1 30.8	+0.5121	0.5804	0.1498	+69	− 2
60 Cancri	5.7	1.12	12.8	11 59.8	8 53.5	+ 5 12.9	+0.4037	0.5775	0.1544	+61	− 8
a Cancri	4.3	+1.13	−12.7	+12 14.0	9 59.1	+ 6 16.1	−0.0056	0.5767	−0.1556	+34	−31
κ Cancri	5.1	1.16	13.1	11 03.6	14 00.3	+10 08.7	+0.5525	0.5737	0.1600	+73	− 1
ω Leonis	5.6	1.25	13.5	9 28.8	23 06.9	− 5 04.0	+0.6673	0.5671	0.1686	+85	+ 5
h Leonis	5.4	1.27	13.3	10 08.7	10 0 40.2	− 3 33.9	−0.2753	0.5660	0.1699	+20	−48
o Leonis	3.8	1.31	13.2	10 20.1	4 47.5	+ 0 24.9	−1.1793	0.5632	0.1732	−39	−80
11 Sextantis	6.0	+1.39	−13.6	+ 8 46.7	12 30.6	+ 7 52.3	−0.9410	0.5581	−0.1783	−19	−81
π Leonis	5.0	1.40	13.6	8 30.6	13 28.3	+ 8 48.0	−0.8375	0.5575	0.1789	−12	−81
14 Sextantis	6.6	1.44	14.4	6 05.1	16 31.4	+11 44.9	+1.1195	0.5556	0.1806	+90	+34
16 Sextantis	6.9	1.45	14.2	6 38.8	17 39.3	−11 09.4	−0.3342	0.5549	0.1812	+55	−15
43 Leonis	6.5	1.50	13.9	7 02.2	11 0 04.1	− 4 57.4	−1.2425	0.5512	0.1840	−45	−83
34 Sextantis	6.7	+1.63	−14.6	+ 4 05.5	9 23.1	+ 4 03.4	+0.0950	0.5462	−0.1869	+42	−30
35 Sext. (1st star)	6.2	1.63	14.2	5 15.4	9 42.7	+ 4 22.5	−1.1851	0.5461	0.1870	−38	−85
36 Sextantis	6.6	1.65	14.9	3 00.0	10 36.0	+ 5 14.0	+1.0102	0.5457	0.1872	+90	+24
p³ Leonis	6.2	1.75	14.7	2 29.0	21 07.2	− 8 34.8	−0.4245	0.5410	0.1886	+12	−61
p⁵ Leonis	5.5	1.82	15.2	0 27.6	12 0 27.4	− 5 20.9	+1.0815	0.5396	0.1887	+90	+29
76 Leonis	6.3	+1.82	−14.5	+ 2 11.0	2 58.5	− 2 54.6	−1.2159	0.5387	−0.1887	−42	−88
ν Leonis	4.4	1.95	14.9	− 0 17.2	11 52.9	+ 5 43.3	−0.2782	0.5357	0.1878	+19	−52
B.A.C. 4134	6.0	2.22	14.4	3 24.8	13 8 31.0	+ 1 43.6	−0.7659	0.5313	0.1820	− 8	−90
B.A.C. 4200	5.7	2.28	14.2	4 04.6	13 25.3	+ 6 28.0	−0.9407	0.5306	0.1798	−19	−90
B.A.C. 4225	6.3	2.30	14.2	4 31.0	15 20.0	+ 8 20.2	−0.8105	0.5304	0.1788	−10	−90
f Virginis	5.9	+2.34	−14.2	− 5 17.8	17 56.1	+10 51.6	−0.4330	0.5303	−0.1775	+10	−62
28 Virginis	7.0	2.39	14.5	6 57.9	20 32.9	−10 36.3	+0.9099	0.5299	0.1760	+83	+17
B.A.C. 4294	6.1	2.41	13.9	5 46.1	23 24.4	− 7 51.0	−0.8832	0.5299	0.1744	−16	−90
B.A.C. 4394	5.9	2.57	13.6	8 27.8	14 10 01.8	+ 2 28.2	+0.2195	0.5298	0.1675	+46	−23
56 Virginis	7.0	2.62	13.7	9 51.3	13 10.2	+ 5 31.0	+1.2132	0.5299	0.1653	+80	+42
58 Virginis	7.0	+2.65	−13.4	−10 02.0	14 32.7	+ 6 51.0	+1.1828	0.5299	−0.1642	+80	+39
a Virginis	1.2	2.70	13.3	10 39.2	18 27.7	+10 38.9	+1.2238	0.5303	0.1612	+79	+44
h Virginis	5.5	2.72	12.5	9 39.8	22 24.5	− 9 31.4	−0.4870	0.5304	0.1579	+ 5	−67
86 Virginis	6.0	2.84	12.4	11 56.3	15 4 57.2	−− 3 10.5	+0.9895	0.5311	0.1522	+78	+23
λ Virginis	4.7	3.02	10.3	12 55.4	21 38.9	−10 59.1	−0.3331	0.5335	0.1355	+12	−56
5 Libræ	6.6	+3.21	− 8.8	−15 02.9	16 11 02.3	+ 1 59.6	+0 2982	0.5360	−0.1201	+44	−19
a¹ Libræ	5.3	3.24	8.5	15 35.6	· 13 22.8	+ 4 15.8	+0.6209	0.5364	0.1173	+68	0
a² Libræ	2.9	3.24	8.5	15 38.2	13 28.5	+ 4 21.3	+0.6590	0.5365	0.1171	+71	+ 2
ν¹ Libræ	5.4	3.31	7.3	15 52.8	21 16.0	+11 54.4	+0.0522	0.5381	0.1074	+29	−32
ν² Libræ	6.9	3.32	7.3	16 06.4	21 21.6	+11 59.9	+0.2941	0.5381	0.1073	+43	−19
ζ¹ Libræ	5.7	+3.41	− 5.5	−16 22.6	17 7 54.2	− 1 47.1	−0.4640	0.5404	−0.0931	− 1	−66
ζ² Libræ	7.0	3.42	5.5	17 06.3	8 32.6	− 1 09.9	+0.2838	0.5405	0.0922	+41	−19
ζ³ Libræ	6.0	3.41	5.3	16 16.5	9 05.3	−10 38.2	−0.6860	0.5405	0.0914	−14,	−90
ζ⁴ Libræ	5.8	3.42	5.1	16 31.3	10 11.2	+ 0 25.6	−0.5114	0.5420	0.0899	− 4	−70
ν Scorpii	4.2	3.62	2.1	19 12.4	18 5 09.1	− 5 12.4	+1.0254	0.5444	0.0621	+71	+28
χ Ophiuchi	5.0	+3.63	− 0.4	−18 14.1	12 25.5	+ 1 50.2	−0.4653	0.5456	−0.0507	− 5	−66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

Name.	Mag.	Red'ns from 1902.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	''	° '	d h m	h m				°	°
B. A. C. 5580	5.7	+3.68	+ 0.8	−19 44.2	18 19 33.0	+ 8 44.1	+0.8838	0.5467	−0.0394	+70	+17
29 Ophiuchi	6.8	3.70	2.6	18 44.4	19 5 08.4	− 5 59.0	−0.5269	0.5478	−0.0238	−12	−72
B. A. C. 6060	6.5	3.73	7.5	18 46.9	20 6 57.1	− 5 50.1	−0.5460	0.5490	+0.0188	−14	−74
B. A. C. 6081	6.5	3.76	8.0	20 19.8	8 52.2	− 3 08.6	+1.2111	0.5488	0.0220	+70	+49
B. A. C. 6287	5 7	3.71	10.5	18 47.3	23 19.3	+10 50.5	−0.0115	0.5485	0.0456	+19	−36
B. A. C. 6294	5.2	+3.70	+10.6	−18 28.1	23 55.6	+11 25.7	−0.3389	0.5485	+0.0466	+ 2	−57
ρ¹ Sagittarii	3.9	3.58	14.4	18 01.7	22 0 04.3	+10 48.1	+0.7565	0.5460	0.0840	+72	+ 8
ρ² Sagittarii	6.1	3.59	14.5	18 29.2	0 08.5	+10 52.2	+1.2679	0.5460	0.0841	+72	+58
ε¹ Sagittarii	5.6	3.50	15.5	16 30.8	9 19.1	− 4 14.7	−0.0752	0.5443	0.0973	+21	−40
ε² Sagittarii	5.0	3.49	15.5	16 21.0	10 11.7	− 3 23.7	−0.1712	0.5442	0.0985	+16	−45
B.A.C. 6746	5.5	+3.48	+15.6	−15 41.6	10 42.3	− 2 54.1	−0.8423	0.5441	+0.0992	−23	−90
g Sagittarii	5.0	3.43	16.3	15 44.8	17 42.8	+ 3 53.1	−0.0534	0.5430	0.1088	+23	−38
B. A. C. 6992	6.2	3.34	17.5	15 05.4	23 4 53.5	− 9 17.5	+0.5220	0.5412	0.1232	+60	− 6
β Capricorni	3 4	3.33	17.5	15 05.2	5 00.1	− 9 10.9	+0.5323	0.5412	0.1234	+61	− 6
B. A. C. 7087	6.2	3.22	17.9	14 03.2	11 29.5	− 2 53.6	+0.2267	0.5401	0.1311	+42	−22
B. A. C. 7221	6.3	+3.19	+18.3	−12 54.2	19 38.9	+ 5 00.5	+0.0780	0.5389	+0.1404	+34	−31
B. A. C. 7242	6.5	3.17	18.2	11 56.4	20 51.1	+ 6 10.4	−0.8030	0.5387	0.1417	−15	−90
ν Aquarii	4.6	3.15	18.7	11 45.8	24 5 01.2	− 9 54.6	+0.1984	0.5376	0.1501	+42	−24
17 Aquarii	6.4	3.01	18.5	9 43.9	11 40.8	− 3 27.3	+0.9862	0.5369	0.1564	25	90
19 Aquarii	5.7	3.01	18.6	10 09.6	12 48.4	2 21.8	−0.3441	0.5368	0.1574	+13	−56
B. A. C. 7562	5.5	+2.90	+18.9	− 9 28.9	22 37.4	+ 7 09.1	+0.5081	0.5361	+0.1657	+65	− 7
ζ¹ Capricorni	5.2	2.90	18.9	9 31.6	22 39.8	+ 7 11.4	+0.5638	0.5361	0.1658	+69	− 3
ζ² Capricorni	6.2	2.90	18.9	9 43.4	23 17.5	+ 7 48.0	−0.8794	0.5361	0.1662	+80	+15
30 Aquarii	5.6	2.83	18.3	6 59.5	25 7 48.0	− 7 57.2	−0.6253	0.5358	0.1724	− 1	−79
B. A. C. 7704	7.3	2.78	18.2	6 18.2	10 00.0	− 5 49.5	−0.9843	0.5358	0.1739	−23	−90
B. A. C. 7717	6.9	+2.77	+18.8	− 8 00.2	10 52.9	− 4 58.0	+0.9975	0.5358	+0.1745	+82	+23
44 Aquarii	5.9	2.74	18.1	5 52.3	14 41.6	− 1 16.4	−0.6226	0.5359	0.1768	0	−79
51 Aquarii	5.8	2.70	18.0	5 19.7	18 11.0	+ 2 06.6	−0.5836	0.5360	0.1788	+ 2	−75
κ Aquarii	5.5	2.63	17.7	4 43.7	26 0 58.2	+ 8 41.2	+0.0015	0.5365	0.1822	+34	·35
Lalande 44337	6.3	2.61	17.4	4 03.5	2 28.7	+10 08.9	−0.4390	0.5367	0.1829	+11	−63
B. A. C. 7951	6.7	+2.57	+17.6	− 4 43.9	5 58.4	−10 27.9	+0.9214	0.5370	+0.1843	+85	+17
Lalande 44872	7.0	2.53	17.1	3 45.8	10 33.5	− 6 01.4	+0.7378	0.5377	0.1860	+84	+ 6
κ Piscium	5.0	2.40	15.1	+ 0 43.4	27 1 12.5	+ 8 10.3	−1.2567	0.5407	0.1895	−47	−89
9 Piscium	6.6	2.39	15.2	0 35.3	1 21.8	+ 8 19.3	−1.0853	0.5407	0.1895	−30	·89
15 Piscium	6.6	2.35	14.9	0 46.5	5 22.4	−11 47.7	−0.5200	0.5418	0.1899	+ 7	−69
16 Piscium	5.6	+2.35	+14.6	+ 1 33.7	5 49.3	−11 21.6	−1.2625	0.5419	+0.1899	−47	−88
λ Piscium	4.7	2.32	14.5	1 14.7	8 33.8	− 8 42.3	−0.4060	0.5427	0.1901	+13	60
21 Piscium	6.1	2.28	14.6	0 32.2	12 08.0	− 5 14.9	+0.1054	0.5439	0.1900	+90	+24
22 Piscium	5.9	2.28	13.9	2 23.4	13 20.4	− 4 04.8	−0.6981	0.5443	0.1900	− 3	−87
25 Piscium	6.3	2.27	14.1	1 33.0	13 52.6	− 3 33.7	+0.2841	0.5445	0.1900	+52	−19
51 Piscium	5.7	+2.12	+11.0	+ 6 25.0	28 8 30.2	− 9 32.3	−1.2710	0 5522	+0.1862	−49	·84
60 Piscium	6.2	2.04	10.4	6 12.5	15 27.7	− 2 48.7	+0.2325	0.5558	0.1833	+48	· 21
62 Piscium	6.0	2.04	10.2	6 46.1	15 52.1	− 2 25.2	0.2696	0.5559	0.1831	+20	− 50
δ Piscium	4.8	2.04	10.1	7 03.3	16 02.9	− 2 14.5	0.5323	0.5561	0.1830	+ 5	68
ε Piscium	4.5	1.97	9.3	7 21.9	22 34.7	+ 4 03.9	+0.3317	0.5597	0.1794	+55	−15
B. A. C. 490	7.5	+1.86	+ 6.2	+11 34.8	29 14 04.2	− 4 58.6	·1.2817	0.5691	+0.1677	−53	−78
54 Ceti	5.5	1.79	6.0	10 33.6	19 50.6	+ 0 35.6	+0.7092	0.5717	0.1622	+90	+ 8
B. A. C. 609	6.2	1.78	5.2	11 49.2	23 31.7	+ 4 08.8	+0.0203	0.5757	0.1583	+36	−30
29 Arietis	6.3	1.66	2.5	14 36.1	30 13 39.6	− 6 14.4	−0.6663	0.5852	0.1407	− 2	−72
ο Arietis	5.8	1.61	1.7	14 53.8	18 28.4	− 1 36.4	−0.3012	0.5886	0.1338	+18	−45
σ Arietis	5.5	+1.59	+ 1.5	+14 40.7	21 19.3	+ 1 08.0	+0.2928	0.5906	+0.1295	+53	12

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

		The Star's				At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1902.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, //	Y	x'	y'		N.	S.
		s	"	° '	d h m	h m					°	°
W.B.(2)vi,1630	5.9	+0.80	-10.2	+17 53.5	7 10 48.4	8 54.1	+0 0467	0.6097	-0.0790		+38	-19
51 Geminorum	5.4	0.83	10.6	16 19.3	15 04.0	11 00.6	+1.2440	0.6073	0.0877		+90	+61
λ Geminorum	3.6	0.83	10.6	16 42.9	16 54.2	9 15.0	+0.6924	0.6661	0.0914		+90	+15
W. 7ʰ 685	5.6	0.87	10.7	17 17.6	22 16.2	- 4 05.7	0.4002	0.6028	0.1017		+13	-48
67 Geminorum	7.5	0.87	11.1	15 50.8	22 55.5	- 3 27.9	+0.9696	0.6023	0.1030		+90	+32
68 Geminorum	5.0	+0 87	-11.0	+16 02.1	23 00.1	- 3 23.5	+0.7750	0.6022	-0.1031		+90	+19
1 Cancri	5.9	0 93	11.3	16 02.9	8 8 20.1	5 35.5	-0.2799	0.5956	0.1196		+20	- 42
B.A.C. 2649	6.3	0.94	11 3	16 46 6	8 56.5	6 09.7	-1.0815	0.5953	0.1207		- 34	73
5 Cancri	6.3	0.94	11.2	16 43 3	10 09.0	7 19.4	-1 1722	0.5945	0.1227		41	73
12 Cancri	6.3	0.96	11.9	13 55.4	13 07.2	10 10.8	+1.2548	0.5923	0.1274		+90	+58
27 Cancri	5.6	+1.01	·12.3	+12 58.5	20 33.4	- 6 39.9	+1.2208	0.5865	-0.1385		+90	+51
29 Cancri	5.9	1.02	12.0	14 31.9	21 10.3	- 5 55.8	-0.4501	0 5862	0.1396		+10	56
A¹ Cancri	5.6	1.07	12.4	13 01.7	9 3 27.7	0 01.0	+0.1804	0.5816	0.1478		+46	-29
A² Cancri	5.8	1.08	12.6	12 28.0	5 03.1	+ 1 30.8	+0.5121	0.5804	0.1498		+69	- 2
60 Cancri	5.7	1.12	12.8	11 59 8	8 53.5	+ 5 12.9	+0.4037	0.5775	0.1544		+61	- 8
α Cancri	4.3	+1.13	-12.7	+12 14.0	9 59.1	+ 6 16.1	-0.0056	0.5767	-0.1556		+34	-31
κ Cancri	5.1	1.16	13.1	11 03.6	14 00.3	+10 08.7	+0.5525	0.5737	0.1600		+73	- 1
ω Leonis	5.6	1.25	13.5	9 28.8	23 06.9	5 04.0	+0.6703	0.5671	0.1686		+85	+ 5
h Leonis	5.4	1.27	13.3	10 08.7	10 0 40.2	- 3 33.9	0.2753	0.5660	0.1699		+20	48
o Leonis	3.8	1.31	13.2	10 20 1	4 47.5	+ 0 24.9	-1.1793	0.5632	0.1732		-39	-80
11 Sextantis	6.0	+1.39	-13.6	+ 8 46.7	12 30.6	+ 7 52.3	0.9410	0.5581	-0.1783		-19	-81
π Leonis	5.0	1.40	13.6	8 30.6	13 28.3	+ 8 48.0	-0.8375	0.5575	0.1789		-12	-81
14 Sextantis	6.6	1.44	14.4	6 05.1	16 31.4	+11 44.9	+1.1195	0.5556	0.1806		+90	+34
16 Sextantis	6.9	1.45	14.2	6 38.8	17 39.3	11 09.4	0 3342	0.5549	0.1812		+55	-15
43 Leonis	6.5	1.50	13.9	7 02.2	11 0 04.1	4 57.4	1 2425	0.5512	0.1840		-45	-83
34 Sextantis	6.7	+1.63	-14.6	+ 4 05.5	9 23.1	+ 4 03 4	+0.0950	0 5462	-0.1869		+42	-30
35 Sext. (1ˢᵗ star)	6.2	1.63	14.2	5 15.4	9 42.7	+ 4 22.5	.1851	0.5461	0.1870		-38	-85
36 Sextantis	6.6	1.65	14.9	3 00.0	10 36.0	+ 5 14.0	+1.0102	0.5457	0.1872		+90	+24
β³ Leonis	6.2	1.75	14 7	2 29.0	21 07.2	8 34.8	0.4245	0 5410	0.1886		+12	-61
β⁵ Leonis	5.5	1.82	15.2	0 27.6	12 0 27.4	5 20 9	+1.0815	0.5396	0.1887		+90	+29
76 Leonis	6.3	+1.82	-14.5	+ 2 11.0	2 58.5	- 2 54 6	1 2159	0.5387	-0.1887		42	-88
υ Leonis	4.4	1.95	14.9	0 17.2	11 52.9	+ 5 43 3	0.2782	0.5357	0.1878		+19	-52
B.A.C. 4134	6.0	2.22	14.4	3 24.8	13 8 31.0	+ 1 43.6	0.7659	0.5313	0.1820		- 8	-90
B.A.C. 4200	5.7	2.28	14.2	4 04.6	13 25.3	+ 6 28.9	0.9407	0.5306	0.1798		19	-90
B.A.C. 4225	6.3	2.30	14.2	4 31.0	15 20.0	+ 8 20.2	0.8105	0.5304	0.1788		10	90
f Virginis	5.9	+2.34	-14.2	- 5 17.8	17 56.1	+10 51.6	0.4330	0.5303	-0.1775		+10	62
28 Virginis	7.0	2.39	14.5	6 57.9	20 32 9	10 36.3	+0.9099	0.5299	0.1760		+83	+17
B.A.C. 4294	6.1	2.41	13.9	5 46.1	23 24.4	7 51 0	0.8832	0.5299	0.1744		-16	-90
B.A.C. 4394	5 9	2.57	13.6	8 27.8	14 10 01.8	+ 2 28 2	+0.2195	0.5298	0.1675		+46	-23
56 Virginis	7.0	2.62	13.7	9 51.3	13 10.2	+ 5 31 0	+1.2132	0.5299	0.1653		+80	+42
58 Virginis	7.0	+2.65	-13.6	-10 02.0	14 32.7	+ 6 51.0	+1.1828	0.5299	-0.1642		+80	+30
α Virginis	1.2	2.70	13.3	10 39 2	18 27.7	+10 38.9	+1.2238	0.5303	0 1612		+79	+44
h Virginis	5.5	2.72	12.5	9 39.8	22 24 5	9 31 4	+0.4870	0.5304	0.1579		+ 5	67
86 Virginis	6.0	2.84	12 4	11 56.3	15 4 57.2	3 10 5	+0.9895	0.5311	0.1522		+78	+23
λ Virginis	4.7	3.02	10.3	12 55.4	21 38 9	-10 59.1	-0.3331	0.5335	0.1355		+12	56
5 Libræ	6.6	+3.21	- 8.8	-15 02.9	16 11 02.3	+ 1 59.6	+0 2982	0.5360	-0.1201		+44	- 19
a¹ Libræ	5.3	3 24	8.5	15 35 6	· 13 22.8	+ 4 15.8	+0.6209	0.5364	0.1173		+68	0
a² Libræ	2.9	3.24	8.5	15 38.2	13 28.5	+ 4 21.3	+0.6590	0.5365	0.1171		+71	+ 2
ν¹ Libræ	5.4	3.31	7.3	15 52.8	21 16.0	+11 54.4	+0.0522	0.5381	0.1074		+29	32
ν⁴ Libræ	6.9	3.32	7.3	16 06.4	21 21.6	+11 59 9	+0.2941	0.5381	0.1073		+43	19
ζ¹ Libræ	5.7	+3.41	- 5.5	-16 22.6	17 7 54.2	1 47.1	-0.4640	0.5404	- 0.0931		- 1	-66
ζ⁴ Libræ	7.0	3 42	5.5	17 06.3	8 32.6	- 1 09 9	+0.2838	0.5405	0.0922		+41	-19
ζ³ Libræ	6.0	3.41	5.3	16 16.5	9 05.3	-10 38.2	-0.6860	0 5405	0.0914		- 14	-90
ζ⁴ Libræ	5.8	3.42	5.1	16 31.3	10 11.2	+ 0 25.6	-0 5114	0.5420	0.0899		4	70
ν Scorpii	4.2	3.62	2.1	19 12.4	18 5 09 1	- 5 12.4	+1.0254	0.5444	0.0621		+71	+28
χ Ophiuchi	5.0	+3.63	- 0.4	-18 14.1	12 25.5	+ 1 50.2	-0.4653	0.5456	-0.0507		5	-66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

Name.	Mag.	Red'ns from 1902.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° '	d h m	h m				°	°
λ Virginis	4.7	+2.79	− 9.0	−12 55.4	13 3 58.2	− 2 52.3	−0.1021	0.5340	−0.1366	+24	−42
5 Libræ	6.6	2.99	7.7	15 02.9	17 18.3	+10 03.1	+0.5117	0.5357	0.1213	+60	− 7
μ Libræ	5.4	2.99	7.0	13 44.6	18 59.2	+11 41.0	−1.1273	0.5359	0.1192	−42	−90
α¹ Libræ	5.3	3.02	7.6	15 35.5	19 38.5	−11 41.0	+0.8300	0.5360	0.1184	+74	+13
α² Libræ	2.9	3.03	7.6	15 38.2	19 44.3	−11 35.4	+0.8679	0.5360	0.1182	+74	+16
ν¹ Libræ	5.4	+3.13	− 6.4	−15 52.7	14 3 31.0	− 4 03.0	+0.2536	0.5373	−0.1085	+41	−21
ν² Libræ	6.9	3.13	6.4	16 06.4	3 36.5	− 3 57.7	+0.4950	0.5373	0.1083	+57	− 7
ο¹ Libræ	6.0	3.21	4.9	15 11.8	10 36.8	+ 2 49.5	−1.2377	0.5384	0.0991	−57	−90
ζ¹ Libræ	5.7	3.26	4.8	16 22.6	14 08.9	+ 6 15.0	−0.2757	0.5391	0.0942	+11	−52
ζ² Libræ	7.0	3.28	4.9	17 06.3	14 47.3	+ 6 52.2	+0.4691	0.5392	0.0934	+53	−69
ζ Libræ	6.0	+3.28	− 4.5	−16 16.5	15 20.1	+ 7 24.0	−0.4994	0.5393	−0.0926	− 3	−69
ζ⁴ Libræ	5.8	3.29	4.3	16 31.3	16 26.0	+ 8 27.8	−0.3264	0.5395	0.0911	+ 7	−56
θ Libræ	4.3	3.41	2.5	16 26.6	15 2 38.3	− 5 39.0	−1.2716	0.5413	0.0765	−66	−90
ν Scorpii	4.2	3.54	− 1.7	19 12.4	11 25.3	+ 2 51.3	+1.1770	0.5429	0.0634	+71	+43
χ Ophiuchi	5.0	3.60	0.0	18 14.1	18 42.5	+ 9 54.8	−0.3232	0.5441	0.0523	+ 2	−55
B. A. C. 5580	5.7	+3.69	+ 1.1	−19 44.2	16 1 50.7	− 7 10.7	−1.0109	0.5453	−0.0410	+70	+28
29 Ophiuchi	6.8	3.75	3.2	18 44.4	11 27.0	+ 2 07.2	−0.4153	0.5464	−0.0256	− 5	−62
B. A. C. 6060	6.5	3.89	8.2	18 46.9	17 13 16.1	+ 3 06.4	−0.4853	0.5489	+0.0168	−10	−69
B. A. C. 6081	6.5	3.91	8.4	20 19.8	15 11.0	+ 4 57.6	+1.2655	0.5490	0.0199	+70	+52
B. A. C. 6287	5.7	3.93	10.9	18 47.3	18 5 36.1	− 5 05.1	+0.0152	0.5492	0.0435	+20	−34
B. A. C. 6294	5.2	+3.93	+11.1	−18 28.0	6 12.3	− 4 30.1	−0.3129	0.5492	+0.0445	+ 2	−55
ρ¹ Sagittarii	3.9	3.92	15.7	18 01.7	19 6 14.0	−·5 14.8	+0.7281	0.5479	0.0821	+72	+ 7
ρ² Sagittarii	6.1	3.92	15.7	18 29.1	6 18.1	− 5 10.8	+1.2377	0.5479	0.0822	+72	+52
ε¹ Sagittarii	5.6	3.89	17.1	16 30.8	15 24.9	+ 3 38.4	−0.1214	0.5469	0.0956	+18	−42
ε² Sagittarii	5.0	3.88	17.2	16 20.9	16 17.0	+ 4 29.0	−0.2183	0.5468	0.0969	+12	−48
B. A. C. 6746	5.5	+3.88	+17.3	−15 41.6	16 47.5	+ 4 58.4	−0.8892	0.5468	+0.0976	−26	−90
g Sagittarii	5.0	3.85	18.2	15 44.8	23 44.7	−11 17.7	−0.1173	0.5460	0.1080	−20	−41
B. A. C. 6992	6.2	3.80	19.6	15 05.3	20 10 49.0	− 1 34.3	+0.4319	0.5445	0.1218	+54	10
β Capricorni	3.4	3.80	19.7	15 05.1	10 55.8	− 1 27.5	+0.4420	0.5445	0.1223	+55	−11
B. A. C. 7087	6.2	3.76	20.3	14 03.1	17 21.6	+ 4 45.9	+0.1241	0.5437	0.1299	+35	−28
B. A. C. 7221	6.3	+3.71	+21.1	−12 54.1	21 1 26.2	−11 24.8	−0.0415	0.5426	+0.1393	+27	·38
B. A. C. 7242	6.5	3.70	21.2	11 56.3	2 37.7	−10 15.5	−0.9228	0.5425	0.1406	−25	−90
8 Aquarii	6.8	3.68	21.5	13 25.6	5 56.7	− 7 03.7	+1.1680	0.5420	0.1442	+77	+39
ν Aquarii	4.6	3.65	21.8	11 45.8	10 43.2	− 2 25.2	+0.0597	0.5414	0.1491	+34	−32
17 Aquarii	6.4	3.60	22.0	9 43.9	17 18.9	+ 3 58.1	−1.1340	0.5407	0.1555	·38	−90
19 Aquarii	5.7	+3.59	+22.1	−10 09.6	18 25.8	+ 5 02.9	−0.4976	0.5406	+0.1566	+ 4	−68
B. A. C. 7562	5.5	3.52	22.7	9 28.9	22 4 09.5	− 9 31.4	+0.3349	0.5396	0.1649	+52	−17
ε¹ Capricorni	5.2	3.52	22.6	9 31.6	4 11.9	− 9 29.1	+0.3896	0.5396	0.1650	+56	14
ε² Capricorni	6.2	3.52	22.7	9 43.3	4 49.3	− 8 52.8	+0.7040	0.5396	0.1653	+80	+ 4
30 Aquarii	5.6	3.47	22.4	6 59.4	13 15.3	− 0 42.5	−0.8152	0.5391	0.1718	−12	−90
B. A. C. 7704	7.3	+3.44	+22.4	− 6 18.1	15 26.8	+ 1 24.8	−1.1764	0.5390	+0.1732	−40	−90
B. A. C. 7717	6.9	3.43	22.7	8 00.1	16 19.3	+ 2 15.8	+0.8030	0.5390	0.1738	+82	+10
44 Aquarii	5.9	3.40	22.4	5 52.2	20 06.6	+ 5 56.0	−0.8228	0.5389	0.1761	−12	−90
51 Aquarii	5.8	3.38	22.4	5 19.6	23 34.8	+ 9 17.8	·0.7893	0.5389	0.1781	−10	−90
κ Aquarii	5.5	3.32	22.2	4 43.6	23 6 20.1	− 8 09.6	−0.2147	0.5389	0.1815	+22	−48
Lalande 44337	6.3	+3.31	+22.1	− 4 03.4	7 50.1	− 6 42.3	−0.6583	0.5390	+0.1822	− 2	−83
B. A. C. 7951	6.7	3.28	22.2	4 43.9	11 19.2	− 3 19.7	+0.6991	0.5391	0.1836	+85	+ 4
Lalande 44872	7.0	3.25	21.9	− 3 45.7	15 53.7	+ 1 06 2	+0.5097	0.5394	0.1853	+68	7
9 Piscium	6.6	3.15	20.3	+ 0 35.4	24 6 42.2	− 8 33.1	−1.3362	0.5412	0.1885	−62	90
12 Piscium	6.8	3.13	20.9	− 1 34.1	7 48.3	− 7 29.0	−1.1559	0.5414	0.1887	+88	+36
15 Piscium	6.6	+3.11	+20.0	+ 0 46.6	10 43.5	− 4 39.3	−0.9107	0.5419	+0.1889	+17	−89
λ Piscium	4.7	3.09	19.7	1 14.8	13 55.8	− 1 33.0	−0.6621	0.5425	0.1890	1	−83
21 Piscium	6.1	3.05	19.7	0 32.3	17 31.2	+ 1 55.6	+0.7632	0.5433	0.1889	+90	+ 7
22 Piscium	5.9	3.06	19.1	2 23.4	18 44.0	+ 3 06.1	−0.9598	0.5436	0.1889	·20	88
25 Piscium	6.3	3.06	19.3	1 33.0	19 16.3	+ 3 37.3	+0.0269	0.5437	0.1888	+37	−33
60 Piscium	6.2	+2.87	+15.7	+ 6 12.6	25 21 09.0	+ 4 40.1	−0.0354	0.5522	+0.1819	+33	−36

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

		The Star's			At Conjunction in R.A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1902.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
62 Piscium	6.0	+2.87	+15.5	+ 6 46.2	25 21 33.8	+ 5 03.9	-0.5423	0.5522	+0.1815	+ 5	-70
δ Piscium	4.8	2.86	15.4	7 03.4	21 44.7	+ 5 14.6	-0.8079	0.5522	0.1814	-10	-83
B. A. C. 274	6.2	2.80	15.2	5 57.5	26 2 56.9	+10 16.5	+1.2694	0.5542	0.1785	+90	+51
ε Piscium	4.5	2.80	14.5	7 22.0	4 23.4	+11 40.0	+0.0645	0.5550	0.1778	+39	-30
ζ Piscium	5.4	2.75	14.1	7 03 7	9 21.3	- 7 32.0	+1.2546	0.5573	0.1745	+90	+50
54 Ceti	5.5	+2.63	+10.8	+10 33.7	27 2 08.0	+ 8 40.5	+0.4546	0.5658	+0.1605	+64	- 7
B. A. C. 609	6.2	2.61	9.8	11 49.3	5 55.0	-11 40.4	-0.2405	0.5679	0.1566	+22	-45
29 Arietis	6.3	2.87	6.8	14 36.2	20 27.5	+ 2 21.2	-0.9248	0.5763	0.1393	-19	-75
ο Arietis	5.8	2.46	5.9	14 53.9	28 1 25.4	+ 7 08.2	-0.5495	0.5792	0.1325	+ 4	-63
σ Arietis	5.5	2.42	5.4	14 40.8	4 21.9	+ 9 58.2	+0.0567	0.5810	0.1283	+38	-24
B. A. C. 1119	6.4	+2.22	+ 1.9	+16 13.1	29 0 11.1	+ 5 02.9	+0.7272	0.5924	+0.0957	+90	+17
B. A. C. 1206	6.0	2.16	+ 0.6	17 02.1	5 43.4	+10 22.4	+0.4050	0.5954	0.0855	+61	- 1
B. A. C. 1240	5.7	2.15	- 0.1	17 55.1	8 46.8	-10 41.3	-0.2294	0.5969	0.0796	+22	-36
B. A. C. 1272	6.3	2.09	0.3	17 04.7	11 39.9	- 7 54.9	+0.8357	0.5984	0.0740	+90	+25
W.B.(2),iv, 248	5.9	2.05	1.5	18 30.4	16 34.3	- 3 12.7	-0.2601	0.6007	0.0641	+20	-36
δ¹ Tauri	4.0	+2.02	- 1.3	+17 18.8	17 35.0	- 2 13.7	+1.0006	0.6011	+0.0620	+90	+38
δ² Tauri	4.7	2.01	1.3	17 13.0	18 02.7	+ 1 47.1	+1.1254	0.6013	0.0610	+90	+49
B. A. C. 1361	6.5	2.04	1.9	18 49.0	18 21.5	- 1 29.1	-0.4583	0.6014	0.0604	+ 9	-49
δ³ Tauri	5.0	2.01	1.6	17 42.2	18 35.3	- 1 15.7	+0.6706	0.6015	0.0604	+89	+17
ε Tauri	3.6	2.03	2.2	18 57.7	19 48.1	- 0 05.8	-0.5193	0.6021	0.0574	+ 5	-53
B. A. C. 1468	6.3	+1.94	- 3.0	+18 33.4	30 2 44.2	+ 6 33.4	+0.2347	0.6048	+0.0431	+50	- 7
ι Tauri	5.2	1.92	3.6	18 40.3	4 43.4	+ 8 28.1	+0.1998	0.6055	0.0388	+47	- 7
B. A. C. 1563	6.5	1.86	4.5	19 40.3	10 12.9	-10 15.6	-0.6186	0.6072	0.0264	0	-59
m Tauri	5.1	1.84	4.2	18 30.7	10 57.2	- 9 33.1	+0.5556	0.6075	0.0248	+74	+14
l Tauri	5.4	1.86	4.8	20 17.3	11 05.3	- 9 25.3	-1.2111	0.6075	0.0244	-49	-70
107 Tauri	6.5	+1.85	- 4.7	+19 43.9	11 29.7	- 9 01.9	-0.6466	0.6076	+0.0236	- 2	-61
B. A. C. 1651	6.5	1.79	5.3	19 42.8	16 10.6	- 4 32.3	-0.5429	0.6087	0.0130	+ 5	-51
119 Tauri	4.6	1.73	5.6	18 31.2	20 32.5	- 0 21.0	+0.6813	0.6096	0.0032	+90	+22
120 Tauri	5.3	1.73	5.6	18 28.1	21 03.0	+ 0 08.3	+0.7333	0.6096	0.0021	+90	+26
B. A. C. 1733	6.3	1.76	6.1	20 24.2	21 03.8	+ 0 09.1	-1.1909	0.6096	+0.0021	-46	-70
B. A. C. 1796	7.5	+1.70	- 6.4	+18 56.2	31 0 29.2	+ 3 26.1	+0.2609	0.6101	-0.0057	+51	- 1
127 Tauri	6.3	1.69	6.3	18 55.8	0 38.8	+ 3 35.3	+0.2665	0.6102	0.0061	+51	- 1
Lalande 11088	6.1	1.66	6.9	19 50.5	4 17.4	+ 7 04.7	-0.6757	0.6105	0.0144	- 4	-66
B. A. C. 1867	7.2	1.66	7.1	20 16.4	4 38.1	+ 7 24.9	-1.1103	0.6105	0.0151	-37	-70
χ¹ Orionis	4.6	1.66	7.1	20 15.4	5 03.1	+ 7 48.8	-1.0996	0.6105	0.0161	-36	-70
χ² Orionis	5.8	+1.65	- 7.0	+19 43.7	5 16.1	+ 8 01.4	-0.5791	0.6105	-0.0166	+ 2	-55
χ³ Orionis	5.1	1.62	7.4	19 41.4	8 32.3	+11 09.5	-0.6067	0.6106	0.0240	0	-58
χ⁴ Orionis	4.8	1.62	7.5	20 08.3	8 42.6	+11 19.4	-1.0568	0.6106	0.0244	-31	-70
68 Orionis	5.6	1.58	7.8	19 48.6	11 49.9	- 9 40.9	-0.8173	0.6106	0.0314	-13	-70
71 Orionis	5.1	1.57	7.8	19 11.2	12 55.9	- 8 37.6	-0.2348	0.6106	0.0339	+22	-31
Lalande 12148	7.0	+1.52	- 7.8	+17 37.2	16 01.3	+ 5 39.7	+1.2054	0.6105	-0.0408	+90	+59
20 Geminorum	6.3	1.49	8.2	17 50.8	19 39.9	- 2 10.0	+0.8170	0.6101	0.0490	+90	+27
21 Geminorum	6.5	1.49	8.2	17 51.1	19 40.2	- 2 09.7	+0.8120	0.6101	0.0490	+90	+26
22 Geminorum	7.2	1.50	8.6	19 30.1	20 32.9	- 1 19.1	-0.8703	0.6100	0.0509	-16	-70
26 Geminorum	5.0	+1.45	- 8.6	+17 44.3	23 34.1	+ 1 34.8	+0.7162	0.6096	-0.0575	+90	+19

AUGUST.

W B.(2),vi,1630	5.9	+1.39	- 9.3	+17 53.5	1 7 19.2	+ 9 01.2	+0.0526	0.6080	-0.0741	+38	-19
λ Geminorum	3.6	+1.34	- 9.6	+16 42.9	13 26.9	- 9 05.9	+0.7294	0.6062	-0.0868	+90	+18
W. 7ʰ 685	5.6	1.30	10.1	17 17.6	18 48.8	- 3 56.8	-0.3400	0.6044	0.0974	+16	-44
67 Geminorum	7.5	1.29	9.9	15 50.8	19 28.1	- 3 19.0	+1.0336	0.6042	0.0986	+90	+37
68 Geminorum	5.0	+1.29	-10.0	+16 02.1	19 32.7	- 3 14.6	+0.8388	0.6041	-0.0988	+90	+24
				NEW	*MOON.*						

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

		The Star's			At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1902.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S
		Δα	Δδ								
		s	''	° '	d　h　m	h　m				°	'
λ Virginis	4.7	+2.79	− 9.0	−12 55.4	13　3 58.2	− 2 52.3	−0.1021	0.5340	−0.1366	+24	−42
5 Libræ	6.6	2.99	7.7	15 02.9	17 18.3	+10 03.1	+0.5117	0.5357	0.1213	+60	− 7
μ Libræ	5.4	2.99	7.0	13 44.6	18 59.2	+11 41.0	·1.1273	0.5359	0.1192	−42	−90
a¹ Libræ	5.3	3.02	7.6	15 35.5	19 38.5	−11 41.0	+0.8300	0.5360	0.1184	+74	+13
a² Libræ	2.9	3.03	7.6	15 38.2	19 44.3	−11 35.4	+0.8679	0.5360	0.1182	+74	+16
ν¹ Libræ	5.4	+3.13	− 6.4	−15 52.7	14　3 31.0	− 4 03.0	+0.2536	0.5373	−0.1085	+41	−21
ν² Libræ	6.9	3.13	6.4	16 06.4	3 36.5	− 3 57.7	+0.4950	0.5373	0.1083	+57	− 7
o¹ Libræ	6.0	3.21	4.9	15 11.8	10 36.8	+ 2 49.5	−1.2377	0.5384	0.0991	−57	−90
ζ¹ Libræ	5.7	3.26	4.8	16 22.6	14 08.9	+ 6 15.0	−0.2757	0.5391	0.0942	+11	52
ζ² Libræ	7.0	3.28	4.9	17 06.3	14 47.3	+ 6 52.2	+0.4691	0.5392	0.0934	+53	−69
ζ Libræ	6.0	+3.28	− 4.5	−16 16.5	15 20.1	+ 7 24.0	−0.4994	0.5393	−0.0926	− 3	−69
ζ⁴ Libræ	5.8	3.29	4.3	16 31.3	16 26.0	+ 8 27.8	−0.3264	0.5395	0.0911	+ 7	−56
θ Libræ	4.3	3.41	2.5	16 26.6	15　2 38.3	− 5 39.0	−1.2716	0.5413	0.0765	−66	−90
ν Scorpii	4.2	3.54	− 1.7	19 12.4	11 25.3	+ 2 51.3	+1.1770	0.5429	0 0634	+71	+43
χ Ophiuchi	5.0	3.60	0 0	18 14.1	18 42.5	+ 9 54.8	−0.3232	0.5441	0 0523	+ 2	−55
B. A. C. 5580	5.7	+3.69	+ 1.1	−19 44.2	16　1 50.7	− 7 10.7	−1.0109	0.5453	−0.0410	+70	+28
29 Ophiuchi	6.8	3.75	3 2	18 44.4	11 27.0	+ 2 07.2	−0.4153	0.5464	−0.0256	− 5	62
B. A. C. 6060	6.5	3.89	8.2	18 46.9	17 13 16.1	+ 3 06.4	−0.4853	0.5489	+0.0168	−10	−69
B. A. C. 6081	6.5	3.91	8.4	20 19.8	15 11.0	+ 4 57.6	+1.2655	0.5490	0.0199	+70	+52
B. A. C. 6287	5.7	3.93	10.9	18 47.3	18　5 36.1	− 5 05.1	+0.0152	0.5492	0.0435	+20	−34
B. A. C. 6294	5.2	+3.93	+11.1	−18 28.0	6 12.3	− 4 30.1	−0.3129	0.5492	+0.0445	+ 2	−55
ρ¹ Sagittarii	3.9	3.92	15.7	18 01.7	19　6 14.0	− 5 14.8	+0.7281	0.5479	0.0821	+72	+ 7
ρ² Sagittarii	6.1	3.92	15.7	18 29.1	6 18.1	− 5 10.8	+1.2377	0.5479	0.0822	+72	+52
c¹ Sagittarii	5.6	3.89	17.1	16 30.8	15 24.9	+ 3 38.4	−0.1214	0.5469	0.0956	+18	42
c² Sagittarii	5.0	3.88	17.2	16 20.9	16 17.0	+ 4 29.0	−0.2183	0.5468	0.0969	+12	48
B. A. C. 6746	5.5	+3.88	+17.3	−15 41.6	16 47.5	+ 4 58.4	−0.8892	0.5468	+0.0976	−26	90
g Sagittarii	5.0	3.85	18.2	15 44.8	23 44.7	−11 17.7	−0.1173	0.5460	0.1080	−20	41
B. A. C. 6992	6.2	3.80	19.6	15 05.3	20 10 49.0	− 1 34.3	+0.4319	0.5445	0.1218	+54	10
β Capricorni	3.4	3.80	19.7	15 05.1	10 55.8	− 1 27.5	+0.4420	0.5445	0.1223	+55	11
B. A. C. 7087	6 2	3.76	20.3	14 03.1	17 21.6	+ 4 45.9	+0.1241	0.5437	0 1299	+35	28
B. A. C. 7221	6.3	+3.71	+21.1	−12 54.1	21　1 26.2	−11 24.8	−0.0415	0.5426	+0.1393	+27	38
B. A. C. 7242	6.5	3.70	21.2	11 56.3	2 37.7	−10 15.5	−0.9228	0.5425	0.1406	25	90
8 Aquarii	6.8	3.68	21.5	13 25.6	5 56.7	− 7 03.7	+1.1680	0.5420	0.1442	+77	+39
ν Aquarii	4.6	3.65	21.8	11 45.8	10 43.2	− 2 25.2	+0.0597	0.5414	0.1491	+34	−32
17 Aquarii	6.4	3.60	22.0	9 43.9	17 18.9	+ 3 58.1	·1.1340	0.5407	0.1555	−38	−90
19 Aquarii	5.7	+3.59	+22.1	−10 09.6	18 25.8	+ 5 02.9	−0.4976	0.5406	+0.1566	+ 4	−68
B. A. C. 7562	5.5	3.52	22.7	9 28.9	22　4 09.5	− 9 31.4	+0.3349	0.5396	0.1640	+52	17
c¹ Capricorni	5.2	3.52	22.6	9 31.6	4 11.9	− 9 29.1	+0.3896	0.5396	0 1650	+56	−14
c² Capricorni	6.2	3.52	22.7	9 43.3	4 49.3	− 8 52.8	+0.7040	0.5396	0.1653	+80	+ 4
30 Aquarii	5.6	3.47	22.4	6 59.4	13 15.3	− 0 42.5	−0.8152	0.5391	0.1718	12	90
B. A. C. 7704	7.3	+3 44	+22.4	− 6 18.1	15 26.8	+ 1 24.8	−1.1764	0.5390	+0.1732	−40	−90
B. A. C. 7717	6.9	3.43	22.7	8 00.1	16 19.3	+ 2 15.8	+0.8030	0.5390	0.1738	+82	+10
44 Aquarii	5.9	3.40	22.4	5 52.2	20 06.6	+ 5 56.0	−0.8228	0.5389	0.1761	−12	90
51 Aquarii	5.8	3.38	22.4	5 19.6	23 34.8	+ 9 17.8	·0.7893	0.5389	0.1781	−10	90
κ Aquarii	5.5	3.32	22.2	4 43.6	23　6 20.1	− 8 09 6	−0.2147	0.5389	0.1815	+22	−45
Lalande 44337	6.3	+3.31	+22.1	− 4 03.4	7 50.1	− 6 42.3	−0 6583	0.5390	+0.1822	− 2	83
B. A. C. 7951	6.7	3.28	22.2	4 43.9	11 19.2	·· 3 19.7	+0.6991	0.5391	0.1836	+85	+ 4
Lalande 44872	7.0	3.25	21.9	− 3 45.7	15 53.7	+ 1 06.2	+0.5097	0.5394	0 1853	+68	7
9 Piscium	6 6	3.15	20.3	+ 0 35.4	24　6 42.2	· 8 33.1	−1.3362	0.5412	0.1885	62	−90
12 Piscium	6.8	3.13	20.9	− 1 34.1	7 48.3	− 7 29.0	1 1559	0.5414	0.1887	+88	+30
15 Piscium	6.6	+3.11	+20.0	+ 0 46.6	10 43 5	− 4 39 3	−0.9107	0.5419	+0.1889	+17	89
λ Piscium	4.7	3.09	19 7	1 14.8	13 55.8	− 1 33 0	−0 6621	0 5425	0.1890	1	83
21 Piscium	6.1	3.05	19 7	0 32.3	17 31.2	+ 1 55 6	+0.7632	0.5431	0.1889	+90	+ 7
22 Piscium	5.9	3.06	19.1	2 23.4	18 44.0	+ 3 08.0	0.9508	0.5436	0 1889	20	85
25 Piscium	6.3	3 06	19.3	1 33.0	19 16 3	+ 3 37.3	+0.0269	0.5437	0 1888	+37	−33
60 Piscium	6.2	+2.87	+15 7	+ 6 12.6	25 21 09.0	+ 4 40.1	−0.0354	0.5522	+0 1819	+33	· 36

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

Name.	Mag.	Red'ns from 1902.0 Δα	Red'ns from 1902.0 Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	Limiting Parallels. N.	Limiting Parallels. S.
		s	**"**	**° '**	**d h m**	**h m**				**°**	**°**
62 Piscium	6.0	+2.87	+15.5	+ 6 46.2	25 21 33.8	+ 5 03 9	−0.5423	0.5522	+0.1815	+ 5	−70
δ Piscium	4.8	2.86	15.4	7 03.4	21 44.7	+ 5 14.6	−0.8079	0.5522	0.1814	−10	−83
B. A. C. 274	6.2	2.80	15.2	5 57 5	26 2 56.9	+10 16.5	+1.2694	0.5542	0.1785	+90	+51
ε Piscium	4.5	2.80	14.5	7 22.0	4 23.4	+11 40.0	+0.0645	0.5550	0.1778	+39	−30
ζ Piscium	5.4	2.75	14.1	7 03 7	9 21.3	− 7 32.0	+1.2546	0.5573	0.1745	+90	+50
54 Ceti	5.5	+2.63	+10.8	+10 33.7	27 2 08.0	+ 8 40.5	+0.4546	0.5658	+0.1605	+64	− 7
B. A. C. 609	6.2	2.61	9.8	11 49.3	5 55.0	−11 40.4	−0.2405	0.5679	0.1566	+22	−45
29 Arietis	6.3	2.87	6.8	14 36.2	20 27.5	+ 2 21.2	−0.9248	0.5763	0.1393	−19	−75
υ Arietis	5.8	2.46	5.9	14 53.9	28 1 25.4	+ 7 08.2	−0.5495	0.5792	0.1325	+ 4	−63
σ Arietis	5.5	2.42	5.4	14 40.8	4 21.9	+ 9 58.2	+0.0567	0.5810	0.1283	+38	−24
B. A. C. 1119	6.4	+2.22	+ 1.9	+16 13.1	29 0 11.1	+ 5 02.9	+0.7272	0.5924	+0.0957	+90	+17
B. A. C. 1206	6.0	2.16	+ 0.6	17 02.1	5 43.4	+10 22.4	+0.4050	0.5954	0.0855	+61	− 1
B. A. C. 1240	5.7	2.15	− 0.1	17 55.1	8 46.8	−10 41.3	−0.2294	0.5969	0.0796	+22	−36
B. A. C. 1272	6.3	2.09	0.3	17 04.7	11 39.9	− 7 54.9	+0.8357	0.5984	0.0740	+90	+25
W.B.(2),iv, 248	5.9	2.05	1.5	18 30.4	16 34.3	− 3 12.7	−0.2601	0.6007	0.0641	+20	−36
δ¹ Tauri	4 0	+2.02	− 1.3	+17 18.8	17 35.0	− 2 13.7	+1.0006	0.6011	+0.0620	+90	+38
δ² Tauri	4 7	2.01	1.3	17 13.0	18 02.7	+ 1 47.1	+1.1254	0.6013	0.0610	+90	+49
B. A. C. 1361	6.5	2.04	1.9	18 49.0	18 21.5	− 1 29.1	−0.4583	0.6014	0.0604	+ 9	−49
δ³ Tauri	5.0	2.01	1.6	17 42.2	18 35.3	− 1 15.7	+0.6706	0.6015	0.0604	+89	+17
ε Tauri	3.6	2.03	2.2	18 57.7	19 48.1	− 0 05.8	−0.5193	0.6021	0.0574	+ 5	−53
B. A. C. 1468	6.3	+1.94	− 3.0	+18 33.4	30 2 44 2	+ 6 33.4	+0.2347	0.6048	+0.0431	+50	− 7
ι Tauri	5.2	1.92	3.6	18 40.3	4 43.4	+ 8 28.1	+0.1998	0.6055	0.0388	+47	− 7
B. A. C. 1563	6.5	1.86	4.5	19 40.3	10 12.9	−10 15.6	−0.6186	0.6072	0.0264	0	−59
m Tauri	5.1	1.84	4.2	18 30.7	10 57.2	− 9 33.1	+0.5556	0.6075	0.0248	+74	+14
l Tauri	5.4	1.86	4.8	20 17.3	11 05.3	− 9 25.3	−1.2111	0.6075	0.0244	−49	−70
107 Tauri	6.5	+1.85	− 4.7	+19 43.9	11 29.7	− 9 01.9	−0.6466	0.6076	+0.0236	− 2	−61
B. A. C. 1651	6.5	1.79	5.3	19 42.8	16 10.6	− 4 32.3	−0.5429	0.6087	0.0130	+ 5	−51
119 Tauri	4.6	1.73	5.6	18 31.2	20 32.5	− 0 21.0	+0 6813	0.6096	0.0032	+90	+22
120 Tauri	5 3	1.73	5.6	18 28.1	21 03.0	+ 0 08.3	+0.7333	0.6096	0.0021	+90	+26
B. A. C. 1733	6.3	1.76	6.1	20 24.2	21 03.8	+ 0 09.1	−1.1909	0.6096	+0.0021	−46	−70
B. A. C. 1796	7.5	+1.70	− 6.4	+18 56.2	31 0 29.2	+ 3 26.1	+0 2609	0.6101	−0.0057	+51	− 1
127 Tauri	6.3	1.69	6.3	18 55.8	0 38.8	+ 3 35.3	+0.2665	0.6102	0.0061	+51	− 1
Lalande 11088	6.1	1.66	6.9	19 50.5	4 17.4	+ 7 04.7	−0.6757	0.6105	0.0144	− 4	−66
B A. C. 1867	7.2	1.66	7.1	20 16.4	4 38.1	+ 7 24.9	−1.1103	0.6105	0.0151	−37	−70
χ¹ Orionis	4.6	1.66	7.1	20 15.4	5 03.1	+ 7 48.8	−1.0996	0.6105	0.0161	−36	−70
χ² Orionis	5.8	+1.65	− 7.0	+19 43.7	5 16.1	+ 8 01.4	−0.5791	0.6105	−0.0166	+ 2	−55
ξ¹ Orionis	5.1	1.62	7.4	19 41.4	8 32.3	+11 09.5	−0.6067	0.6106	0.0240	0	−58
χ⁴ Orionis	4.8	1.62	7.5	20 08.3	8 42.6	+11 19.4	−1.0568	0.6106	0.0244	−31	−70
68 Orionis	5.6	1.58	7.8	19 48.6	11 49.9	− 9 40.9	−0.8173	0.6106	0.0314	−13	−70
71 Orionis	5.1	1.57	7.8	19 11.2	12 55.9	− 8 37.6	−0.2348	0.6106	0.0339	+22	−31
Lalande 12148	7.0	+1.52	− 7.8	+17 37.2	16 01.3	+ 5 39.7	+1.2054	0.6105	−0.0408	+90	+59
20 Geminorum	6.3	1.49	8.2	17 50.8	19 39.9	− 2 10.0	+0.8170	0.6101	0.0490	+90	+27
21 Geminorum	6.5	1.49	8.2	17 51.1	19 40.2	− 2 09.7	+0.8120	0.6101	0.0490	+90	+26
22 Geminorum	7.2	1.50	8.6	19 30.1	20 32.9	− 1 19.1	−0.8703	0.6100	0.0509	−16	−70
26 Geminorum	5.0	+1.45	− 8.6	+17 44.3	23 34.1	+ 1 34.8	+0.7162	0.6096	−0.0575	+90	+19

AUGUST.

W B.(2),vi,1630	5.9	+1.39	− 9.3	+17 53.5	1 7 19.2	+ 9 01.2	+0.0526	0.6080	−0.0741	+38	−19
λ Geminorum	3.6	+1.34	− 9.6	+16 42.9	13 26.9	− 9 05.9	+0.7294	0.6062	−0.0868	+90	+18
W. 7ᵇ 685	5.6	1.30	10.1	17 17.6	18 48 8	− 3 56.8	−0 3400	0.6044	0.0974	+16	−44
67 Geminorum	7.5	1.29	9.9	15 50.8	19 28 1	− 3 19.0	+1.0336	0.6042	0.0986	+90	+37
68 Geminorum	5.0	+1.29	−10.0	+16 02.1	19 32 7	− 3 14.6	+0.8388	0.6041	−0.0988	+90	+24

NEW MOON.

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

| | | The Star's | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
Name.	Mag.	Red'ns from 1902.0 Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	''	° '	d h m	h m				°	°
34 Sextantis	6.7	+1.27	−11.5	+ 4 05.5	5 3 22.9	+ 1 39.1	+0 4972	0.5621	−0.1894	+67	− 7
35 Sext. (1st *star*)	6.2	1.27	11.3	5 15.4	3 41.6	+ 1 57.2	−0.7562	0.5619	0.1895	− 7	−79
d Leonis	5.0	1.31	11.2	4 08.4	11 35.1	+ 9 34.7	−1.1170	0.5581	0.1913	−32	−86
p³ Leonis	6.2	1.33	11.3	2 29.1	14 32.5	−11 33.8	+0.0227	0.5567	0.1916	+36	−33
75 Leonis	5.4	1.37	11.1	2 32.8	19 20.7	− 6 55.1	−0.9635	0.5547	0.1919	−20	−87
76 Leonis	6.3	+1.37	−11.1	+ 2 11.1	20 06.6	− 6 10.8	−0.7368	0.5544	−0.1918	− 6	−86
79 Leonis	5.5	1.40	11.1	+ 1 56.5	22 30.3	− 3 51.9	−0.9467	0.5533	0.1918	−19	−88
v Leonis	4.4	1.46	11.2	− 0 17.2	6 4 34.9	+ 2 C1.0	+0.2013	0.5509	0.1913	+47	−24
B. A. C. 4134	6.0	1.65	10.7	3 24.7	7 0 15.3	− 2 56.7	−0.2408	0.5446	0.1854	+21	−49
B. A. C. 4200	5.7	1.69	10.5	4 04.6	4 56.8	+ 1 35.8	−0.4065	0.5434	0.1832	+12	−60
B. A. C. 4225	6.3	+1.72	−10.4	− 4 30.9	6 46.6	+ 3 22.2	−0.2760	0.5430	−0.1822	+19	−51
f Virginis	5.9	1.76	10.5	5 17.7	9 16.2	+ 5 47.1	+0.0955	0.5424	0.1808	+39	−29
B. A. C. 4294	6.1	1.82	10.2	5 46.1	14 30.0	+10 51.3	−0.3417	0.5414	0.1776	+15	−56
B. A. C. 4394	5.9	1.96	10.0	8 27.7	8 0 45.1	− 3 13.1	+0.7447	0.5397	0.1704	+79	+ 6
h Virginis	5.5	2.11	9.1	9 39.8	12 43.8	+ 8 23.2	+0.0503	0.5385	0.1605	+35	−32
λ Virginis	4.7	+2.43	− 7.4	−12 55.3	9 11 24.5	+ 6 21.6	+0.1846	0.5379	−0.1377	+40	−24
5 Libræ	6.6	2.63	6.3	15 02.9	10 0 35.0	− 4 52.5	+0.7903	0.5384	0.1223	+75	+11
μ Libræ	5.4	2.62	5.6	13 44.6	2 14.9	− 3 15.6	+0.8389	0.5385	0.1201	−20	−90
a¹ Libræ	5.3	2.67	6.2	15 35.5	2 53.9	− 2 37.9	+1.1061	0.5386	0.1193	+74	+34
a² Libræ	2.9	2.67	6.1	15 38.2	2 59.5	− 2 32.5	+1.1440	0.5386	0.1192	+74	+38
v¹ Libræ	5.4	+2.77	− 5.1	−15 52.7	10 42.1	+ 4 55.7	+0.5295	0.5392	−0.1094	+60	− 5
v² Libræ	6.9	2.78	5.1	16 06.4	10 47.6	+ 5 01.1	+0.7695	0.5392	0.1092	+74	+ 9
o¹ Libræ	6.0	2.84	3.7	15 11.8	17 44.9	+11 45.3	−0.9586	0.5398	0.1000	−30	−90
ζ¹ Libræ	5.7	2.91	3.5	16 22.6	21 15.6	− 8 50.6	−0.0040	0.5402	0.0952	+24	−35
ζ² Libræ	7.0	2.93	3.7	17 06.2	21 53.9	− 8 13.5	+0.7365	0.5403	0.0943	+73	+ 7
ζ³ Libræ	6.0	+2.92	− 3.3	−16 16.5	22 26.4	− 7 42.0	−0.2272	0.5403	−0.0935	+12	−49
ζ⁴ Libræ	5.8	2.94	3.2	16 31.3	23 32.0	− 6 38.5	−0.0565	0.5404	0.0920	+22	−38
θ Libræ	4.3	3.06	− 1.5	16 26.5	11 9 41.9	+ 3 12.2	−1.0073	0.5416	0.0775	−37	−90
χ Ophiuchi	5.0	3.29	+ 0.7	18 14.1	12 1 44.3	− 5 15.9	−0.0801	0.5440	0.0534	+18	−40
24 Scorpii	5.5	3.35	2.2	17 33.1	8 45.9	+ 1 32.2	−1.1714	0.5443	0.0425	−54	−90
B. A. C. 5580	5.7	+3.41	+ 1.5	−19 44.2	8 52.6	+ 1 38.8	+1.2426	0.5443	−0.0422	+70	+53
29 Ophiuchi	6.8	3.48	3.6	18 44.4	18 29.4	+10 57.2	−0.1942	0.5453	−0.0267	+ 7	−47
B. A. C. 6060	6.5	3.72	8.5	18 46.9	13 20 21.5	+11 59.4	−0.3044	0.5474	+0.0150	0	−54
B. A. C. 6287	5.7	3.83	11.5	18 47.3	14 12 42.9	+ 3 49.3	+0.1656	0.5480	0.0414	+29	−25
B. A. C. 6294	5.2	3.83	11.6	18 28.0	13 19.2	+ 4 24.4	−0.1630	0.5480	0.0425	+10	−46
ρ¹ Sagittarii	3.9	+3.94	+16.0	−18 01.7	15 13 20.5	+ 3 39.4	+0.8282	0.5478	+0.0800	+72	+13
v Sagittarii	4.7	3.90	16.3	16 08.1	13 24.1	+ 3 42.9	−1.2449	0.5478	0.0800	−61	−90
e¹ Sagittarii	5.6	3.94	17.7	16 30.8	22 29.9	−11 28.8	−0.0385	0.5475	0.0935	+22	−37
e² Sagittarii	5.0	3.94	17.8	16 20.9	23 21.8	−10 38.6	−0.1372	0.5474	0.0948	+17	−43
B. A. C. 6746	5.5	3.92	18.0	15 41.6	23 52.2	−10 09.2	−0.8073	0.5474	0.0955	−21	−90
g Sagittarii	5.0	+3.94	+19.0	−15 44.8	16 6 47.6	− 3 27.1	−0.0527	0.5470	+0.1053	+23	38
B. A. C. 6992	6.2	3.95	20.6	15 05.3	17 48.2	+ 7 12.4	+0.4702	0.5464	0.1200	+56	− 0
β Capricorni	3.4	3.95	20.6	15 05.1	17 55.1	+ 7 18.9	+0.4805	0.5464	0.1201	+57	− 8
B. A. C. 7087	6.2	3.93	21.6	14 03.1	17 0 17.9	− 9 30.2	+0.1485	0.5459	0.1282	+37	−27
B. A. C. 7221	6.3	3.92	22.5	12 54.1	8 18.4	− 2 45.0	−0.0344	0.5454	0.1377	+28	−37
B. A. C. 7242	•6.5	+3.90	+22.6	−11 56.3	9 29.2	− 1 36.4	−0.0145	0 5454	+0.1391	−23	−90
8 Aquarii	6.8	3.92	22.9	13 25.6	12 46.7	+ 1 34.9	+1.1604	0.5451	0.1428	+77	+38
v Aquarii	4.6	3 90	23.4	11 45.7	17 29.7	+ 6 08.9	+0.0454	0.5449	0.1478	+33	−32
17 Aquarii	6.4	3.87	24.0	9 43.8	18 0 00.8	−11 32.4	−1.1595	0 5445	0.1544	41	−90
19 Aquarii	5.7	3.87	24.1	10 09.6	1 06.9	·10 28.4	−0.5268	0.5445	0.1554	+ 3	−70
B. A. C. 7562	5.5	+3 85	+24.7	− 9 28.8	10 43.1	− 1 10.3	+0 2791	0.5441	+0.1641	+49	20
c¹ Capricorni	5.2	3 85	24.7	9 31.6	10 45.5	− 1 08.0	+0.3344	0.5441	0.1641	+53	−17
c² Capricorni	6.2	3.85	24.7	9 43.3	11 22.4	− 0 32.2	+0.6455	0.5441	0.1646	+77	+ 1
30 Aquarii	5.6	3.82	25.0	6 59.4	19 41.2	+ 7 30.8	−0.8852	0.5440	0.1710	17	−90
B. A. C. 7704	7 3	3.81	25.2	6 18.0	21 50.8	+ 9 36.3	−1.2493	0 5440	0.1726	−49	−90
B. A. C. 7717	6.9	+3 81	+25.3	− 8 00.1	22 42.5	+10 26.4	+0 7169	0.5440	+0.1732	+82	+ 5

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

										Limiting Parallels.	
	THE STAR'S				AT CONJUNCTION IN R. A.						
Name.	Mag.	Red'ns from 1902.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° '	d h m	h m				°	°
44 Aquarii	5.9	+3.80	+25.3	− 5 52.2	19 2 26.4	− 9 56.8	−0.9080	0.5440	+0.1756	−18	−90
51 Aquarii	5.8	3.78	25.3	5 19.6	5 51.4	− 6 38.2	−0.8825	0.5441	0.1776	−16	−90
κ Aquarii	5.5	3.76	25.3	4 43.6	12 30.5	− 0 11.7	−0.3251	0.5444	0.1812	+16	−54
Lalande 44337	6.3	3.76	25.3	4 03.3	13 59.1	+ 1 14.1	−0.7694	0.5444	0.1819	− 9	−90
B. A. C. 7951	6.7	3.74	25.3	4 43.8	17 24.8	+ 4 33.3	+0.5728	0.5446	0.1834	+73	− 3
Lalande 44872	7.0	+3.73	+25.2	− 3 45.7	21 55.0	+ 8 54.9	+0.3752	0.5449	+0.1851	+57	−14
12 Piscium	6.8	3.67	24.5	1 34.1	20 13 35.1	+ 0 05.2	+0.9885	0.5467	0.1887	+88	+22
13 Piscium	6.4	3.66	24.5	− 1 37.2	14 45.8	+ 1 13.7	+1.2655	0.5469	0.1888	+88	+48
15 Piscium	6.6	3.66	24.1	+ 0 46.7	16 27.7	+ 2 52.3	−0.9369	0.5472	0.1889	−18	−90
λ Piscium	4.7	3.65	23.8	1 14.8	19 37.3	+ 5 55.8	−0.8315	0.5478	0.1890	−12	−88
21 Piscium	6.1	+3.62	+23.7	+ 0 32.3	23 09.6	+ 9 21.4	+0.5811	0.5484	+0.1890	+77	− 1
22 Piscium	5.9	3.63	23.3	2 23.5	21 0 21.5	+10 30.9	−1.1365	0.5488	0.1889	−35	−88
25 Piscium	6.3	3.62	23.4	1 33.1	0 53.4	+11 01.7	−0.1548	0.5488	0.1889	+26	−45
60 Piscium	6.2	3.53	20.2	6 12.7	22 2 29.1	+11 47.5	−0.2529	0.5555	0.1816	+21	−49
62 Piscium	6.0	3.54	20.0	6 46.2	2 53.7	−11 48.7	−0.7587	0.5556	0.1814	− 7	−77
δ Piscium	4.8	+3.52	+20.0	+ 7 03.4	3 04.6	−11 38.2	−1.0244	0.5557	+0.1813	−25	−83
B. A. C. 274	6.2	3.48	19.6	5 57.6	8 14.6	− 6 38.4	+1.0442	0.5574	0.1784	+90	+28
ε Piscium	4.5	3.49	19.1	7 22.1	9 40.6	− 5 15.4	−0.1606	0.5580	0.1775	+26	−42
ζ Piscium	5.4	3.45	18.6	7 03.7	14 37.0	− 0 28.9	+1.0243	0.5597	0.1742	+90	+27
54 Ceti	5.5	3.38	15.2	10 33.7	23 7 22.3	− 8 18.0	+0.2140	0.5664	0.1599	+48	−19
B. A. C. 609	6.2	+3.37	+14.2	+11 49.4	11 09.9	− 4 38.3	−0.4841	0.5681	+0.1560	+ 8	−61
29 Arietis	6.3	3.30	10.9	14 36.2	24 1 47.5	+ 9 28.5	−1.1764	0.5746	0.1399	−41	−75
o Arietis	5.8	3.26	9.8	14 54.0	6 ·48.3	− 9 41.5	−0.7996	0.5769	0.1318	−11	−75
σ Arietis	5.5	3.22	9.4	14 40.9	9 46.7	− 6 49.6	−0.1901	0.5783	0.1275	+24	−38
B. A. C. 1119	6.4	3.03	5.0	16 13.2	25 5 54.5	−11 26.3	+0.4926	0.5871	0.0952	+68	+ 3
B. A. C. 1206	6.0	+2.99	+ 3.7	+17 02.2	11 33.5	− 6 00.1	+0.1705	0.5894	+0.0850	+45	−14
B. A. C. 1240	5.7	2.97	2.8	17 55.1	14 40.9	− 2 59.8	−0.4685	0.5906	0.0794	+ 8	−51
B. A. C. 1272	6.3	2.93	2.5	17 04.7	17 37.8	− 0 09.6	−0.6909	0.5917	0.0737	+80	+12
W.B.(2),iv,248	5.9	2.88	1.0	18 30.5	22 39.3	+ 4 40.3	−0.4932	0.5934	0.0640	+ 7	−52
δ¹ Tauri	4 0	2.85	1.3	17 18.8	23 41.7	+ 5 40.4	+0.7829	0.5938	0.0620	+90	+23
δ² Tauri	4.7	+2.84	+ 1.2	+17 13.0	26 0 09.9	+ 6 07.5	+0.9097	0.5939	+0.0605	+90	+32
B. A. C. 1361	6.5	2.87	0.7	18 49.0	0 29.2	+ 6 26.0	−0.6919	0.5940	0.0604	− 5	−69
δ³ Tauri	5.0	2.85	1.0	17 42.2	0 43.3	+ 6 39.6	+0.4495	0.5941	0.0599	+65	+ 4
ε Tauri	3.6	2.85	+ 0.2	18 57.8	1 58.0	+ 7 51.4	−0.7526	0.5946	0.0575	− 9	−71
B. A. C. 1468	6.3	2.75	− 0.9	18 33.4	9 05.1	− 9 18.0	+0.0167	0.5966	0.0430	+36	−18
ι Tauri	5.2	+2.72	− 1.4	+18 40.4	11 07.5	− 7 20.3	−0.0170	0.5971	+0.0388	+34	−19
B. A. C. 1563	6.5	2.67	2.8	19 40.3	16 46.4	− 1 54.6	−0.8392	0.5984	0.0270	−15	−70
m Tauri	5.1	2.63	2.5	18 30.8	17 31.9	− 1 10.9	+0.3507	0.5986	0.0254	+57	+ 1
107 Tauri	6.5	2.65	3.0	20 17.3	18 05.4	− 0 38.7	−0.8664	0.5987	0.0239	−17	−70
B. A. C. 1651	6.5	2.58	3.8	19 42.9	22 54.6	+ 3 59.2	−0.7557	0.5996	0.0140	− 9	−70
115 Tauri	5.4	+2.51	− 3.7	+17 52.6	27 1 24.8	+ 6 23.5	+1.1259	0.5999	+0.0085	+90	+53
119 Tauri	4.6	2.50	4.2	18 31.2	3 24.4	+ 8 18.5	+0.4903	0.6002	0.0044	+68	+12
120 Tauri	5.3	2.50	4.2	18 28.2	3 55.7	+ 8 48.5	+0.5435	0.6002	+0.0033	+73	+15
B. A. C. 1796	7.5	2.46	5.3	18 56.3	7 28.3	−11 47.2	+0.0696	0.6006	−0.0043	+39	+12
127 Tauri	6.3	2.45	5.1	18 55.9	7 38.2	−11 37.7	+0.0758	0.6006	−0.0046	+39	−12
Lalande 11088	6.1	+2.41	− 6.0	+19 50.5	11 23.2	− 8 01.5	−0.8744	0.6008	−0.0127	−17	−70
χ² Orionis	5.8	2.40	6.1	19 43.3	12 24.1	− 7 03.0	−0.7751	0.6009	0.0149	−11	−70
χ³ Orionis	5.1	2.35	6.6	19 41.4	15 46.4	− 3 48.7	−0.7987	0.6009	0.0222	−12	−70
χ⁴ Orionis	4.8	2.35	6.8	20 08.3	15 57.1	− 3 38.4	−1.2542	0.6009	0.0225	−59	−70
68 Orionis	5.6	2.31	7.2	19 48.6	19 10.2	− 0 32.9	−1.0066	0.6009	0.0294	−27	−70
71 Orionis	5.1	+2.28	− 7.1	+19 11.3	20 18.3	+ 0 32.5	−0.4144	0.6009	−0.0318	+11	−44
Lalande 12148	7.0	2.21	7.1	17 37.2	23 29.5	+ 3 36.2	+1.0507	0.6007	0.0388	+90	+44
20 Geminorum	6.3	2.16	7.7	17 50.8	28 3 15.0	+ 7 12.8	+0.6632	0.6004	0.0465	+87	+18
21 Geminorum	6.5	2.16	7.7	17 51.1	3 15.3	+ 7 13.1	+0.6579	0.6004	0.0465	+87	+18
22 Geminorum	7.2	2.18	8.3	19 30.2	4 09.6	+ 8 05.3	−1.0464	0.6003	0.0484	−30	−70
26 Geminorum	5.0	+2.11	− 8.2	+17 44.3	7 16.5	+11 04.9	+0.5674	0.6000	−0.0549	+75	+11

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

		The Star's Red'ns from 1902.0			At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	''	° ′	d h m	h m				°	°
W.B.(2),vi,1630	5.9	+2.01	– 9.2	+17 53.5	28 15 15.8	– 5 14.6	–0.0907	0.5987	–0.0711	+30	–27
51 Geminorum	5.4	1.93	9.2	16 19.4	19 40.7	– 0 59.9	+1.1550	0.5977	0.0799	+90	+50
λ Geminorum	3.6	1.92	9.6	16 42.9	21 34.4	+ 0 49.3	+0.6060	0.5972	0.0835	+79	+11
W. 7ʰ, 685	5.6	1.86	10.3	17 17.6	29 3 05.7	+ 6 07.9	–0.4672	0.5958	0.0940	+ 9	–53
67 Geminorum	7.5	1.84	10.0	15 50.8	3 46.0	+ 6 46.7	+0.9252	0.5956	0.0952	+90	+30
68 Geminorum	5.0	+1.84	–10.1	+16 02.1	3 50.8	+ 6 51.3	+0.7289	0.5956	–0.0954	+90	+17
1 Cancri	5.9	1.73	10.8	16 03.0	13 22.0	– 7 59.4	–0.2755	0.5926	0.1124	+19	–42
B. A. C. 2649	6.3	1.73	10.8	16 46.8	13 59.0	– 7 23.8	–1.0809	0.5924	0.1134	–32	–73
5 Cancri	6.3	1.73	11.1	16 43.3	15 12.4	– 6 13.1	–1.1633	0.5915	0.1154	–41	–73
29 Cancri	5.9	1.60	11.4	14 31.9	30 2 27.1	+ 4 36.1	–0.3571	0.5877	0.1332	+14	–49
A¹ Cancri	5.6	+1.54	–11.4	+13 01.8	8 34.6	+10 30.0	+0.3164	0.5853	–0.1421	+53	–12
A² Cancri	5.8	1.53	11.4	12 28.0	10 09.3	–11 58.8	+0.6587	0.5843	0.1442	+84	+ 7
60 Cancri	5.7	1.50	11.4	11 59.8	13 57.7	– 8 18.8	+0.5749	0.5828	0.1492	+74	+ 2
α Cancri	4.3	+1.49	–11.5	+12 14.0	15 02.6	– 7 16.3	+0.1736	0.5823	–0.1506	+45	–20

NEW MOON.

SEPTEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
B. A. C. 4134	6.0	+1.49	– 9.3	– 3 24.7	3 9 31.5	+ 8 07.6	–0.0890	0.5494	–0.1853	+29	–40
B. A. C. 4200	5.7	1.52	9.1	4 04.5	14 09.6	–11 23.4	–0.2460	0.5484	0.1832	+21	–49
B. A. C. 4225	6.3	1.53	9.0	4 30.9	· 15 58.0	– 9 38.4	–0.1138	0.5480	0.1823	+28	–41
f Virginis	5.9	1.55	9.0	5 17.7	18 25.6	– 7 15.6	+0.2613	0.5476	0.1810	+49	–20
B. A. C. 4294	6.1	1.59	8.7	5 46.1	23 35.5	– 2 15.5	–0.1661	0.5467	0.1779	+25	–44
B. A. C. 4394	5.9	+1.69	– 8.2	– 8 27.7	4 9 41.3	+ 7 30.9	+0.9296	0.5453	–0.1709	+82	+19
h Virginis	5.5	1.80	7.4	9 39.7	21 29.1	– 5 03.7	+0.2537	0.5441	0.1614	+47	– 21
B. A. C. 4591	6.3	1.86	6.4	9 13.2	5 4 23.6	+ 1 37.9	–1.3132	0.5436	0.1546	–65	–90
λ Virginis	4.7	2.05	5.7	12 55.3	19 49.3	– 7 25.7	+0.4077	0.5430	0.1383	+54	–12
5 Libræ	6.6	2.22	4.6	15 02.9	6 8 49.0	+ 5 09.2	+1.0185	0.5430	0.1228	+75	+26
μ Libræ	5.4	+2.22	– 4.1	–13 44.5	10 27.6	+ 6 44.8	–0.6015	0.5430	–0.1207	– 6	78
ν¹ Libræ	5.4	2.34	3.6	15 52.7	18 48.7	– 9 10.0	+0.7631	0.5432	0.1099	+74	+ 9
ν² Libræ	6.9	2.35	3.6	16 06.4	18 54.1	– 9 04.7	+1.0019	0.5432	0.1097	+74	+25
o¹ Libræ	6.0	2.40	2.3	15 11.7	7 1 46.9	– 2 24.9	–0.7159	0.5434	0.1004	–15	–90
o² Libræ	7.0	2.41	2.1	14 47.1	2 45.6	– 1 28.1	–1.2629	0.5434	0.0991	–62	–90
ζ¹ Libræ	5.7	+2.47	– 2.2	–16 22.5	5 15.7	+ 0 57.3	+0.2346	0.5435	–0.0956	+38	– 22
ζ² Libræ	7.0	2.49	2.4	17 06.2	5 53.5	+ 1 33.9	+0.9721	0.5435	0.0947	+73	+24
ζ³ Libræ	6.0	2.48	2.0	16 16.4	6 25.8	+ 2 05.2	+0.0127	0.5435	0.0939	+25	34
ζ⁴ Libræ	5.8	2.48	1.9	16 31.3	7 30.8	+ 3 08.0	+0.1827	0.5435	0.0924	+35	– 24
θ Libræ	4.3	2.61	– 0.3	16 26.5	17 35.7	–11 06.2	–0.7644	0.5439	0.0778	–20	90
49 Libræ	5.6	+2.63	+ 0.2	–16 14.7	20 46.3	– 8 01.7	–1.2213	0.5441	–0.0731	–58	– 90
χ Ophiuchi	5.0	2.82	1.6	18 14.0	8 9 33.1	+ 4 20.7	+0.1572	0.5445	0.0537	+29	– 25
24 Scorpii	5.5	2.89	2.9	17 33.1	16 33.4	+11 07.5	–0.9338	0.5449	0.0428	–35	90
29 Ophiuchi	6.8	3.02	4.2	18 44.4	9 2 16.1	– 3 28.4	+0.0371	0.5452	–0.0275	+20	32
B. A. C. 6060	6.5	3.30	8.6	18 46.9	10 4 11.1	– 2 23.2	–0.0907	0.5458	0.0141	+10	40
B. A. C. 6287	5.7	+3.45	+11.3	–18 47.3	20 37.4	–10 28.4	+0.3646	0.5458	+0.0403	+41	14
B. A. C. 6294	5.2	3.45	11.6	18 28.0	21 13.8	– 9 53.2	+0.0354	0.5458	0.0413	+21	33
ρ¹ Sagittarii	3.9	3.63	15.6	18 01.7	11 21 23.2	–10 30.2	+0.9990	0.5453	0.0783	+72	+26
υ Sagittarii	4.7	3.59	16.1	18 08.1	21 26.9	–10 26.6	–1.0755	0.5453	0.0784	–42	90
c¹ Sagittarii	5.6	3.67	17.4	16 30.7	12 6 35.8	– 1 35.1	+0.1202	0.5452	0.0918	+31	28
c² Sagittarii	5.0	+3.67	+17.5	–16 20.9	7 27.9	– 0 44.7	+0.0204	0.5452	+0.0930	+26	33
B. A. C. 6746	5.5	3.66	17.9	15 41.6	7 58.5	– 0 15.1	–0.6505	0.5452	0.0937	–11	84
g Sagittarii	5.0	3.71	18.8	15 44.8	14 55.9	+ 6 29.1	+0.0945	0.5449	0.1037	+31	–29
B. A. C. 6992	6.2	3.75	20.3	15 05.3	13 1 58.9	– 6 49.1	+0.6004	0.5447	0.1181	+66	– 1
β Capricorni	3.4	3.75	20.4	15 05.1	2 05.7	– 6 42.5	+0.6104	0.5447	0.1182	+67	0
B. A. C. 7087	6.2	+3.77	+21.4	–14 03.1	8 29.5	– 0 30.8	+0.2686	0.5446	+0.1263	+44	– 20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

Name.	Mag.	Red'ns from 1902.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	**"**	**° '**	**d h m**	**h m**				**°**	**°**
B. A. C. 7221	6.3	+3.79	+22.5	−12 54.1	**13** 16 30.4	+ 7 14.7	+0.0725	0.5446	+0.1358	+33	−30
B. A. C 7242	6.5	3.78	22.8	11 56.3	17 41.3	+ 8 23.4	−0.8080	0.5446	0.1372	−16	−90
8 Aquarii	6.8	3.82	22.9	13 25.6	20 58.8	+11 34.7	+1.2578	0.5446	0.1409	+77	+51
ν Aquarii	4.6	3.82	23.6	11 45.7	**14** 1 41.4	− 7 51.6	+0.1365	0.5447	0.1460	+38	−27
17 Aquarii	6.4	3.82	24.5	9 43.8	8 11.7	− 1 33.7	−1.0764	0.5449	0.1527	−34	−90
19 Aquarii	5.7	+3.83	+24.5	−10 09.6	9 17.6	− 0 29.9	−0.4472	0.5449	+0.1538	+ 7	−63
B. A. C. 7562	5.5	3.85	25.3	9 28.8	18 51.2	+ 8 45.6	+0.3392	0.5452	0.1626	+52	−16
ↄ¹ Capricorni	5.2	3.85	25.3	9 31.5	18 53.6	+ 8 47.9	+0.3939	0.5453	0.1626	+56	−13
ↄ² Capricorni	6.2	3.85	25.3	9 43.3	19 30.3	+ 9 23.5	+0.7027	0.5453	0.1631	+80	+ 4
30 Aquarii	5.6	3.85	26.0	6 59.3	**15** 3 45.7	− 6 36.9	−0.8372	0.5460	0.1698	−14	−90
B. A. C. 7704	7.3	+3.86	+26.2	− 6 18.0	5 54.3	− 4 32.4	−1.2030	0.5461	+0.1714	−43	−90
B. A. C. 7717	6.9	3.87	26.1	8 00.1	6 45.5	− 3 42.8	+0.7523	0.5462	0.1720	+77	− 7
44 Aquarii	5.9	3.87	26.5	5 52.1	10 27.4	− 0 08.0	−0.8715	0.5466	0.1745	−16	−90
51 Aquarii	5.8	3.88	26.6	5 19.5	13 50.3	+ 3 08.5	−0.8524	0.5469	0.1767	−14	−90
κ Aquarii	5.5	3.89	26.9	4 43.6	20 24.8	+ 9 30.4	−0.3104	0.5477	0.1805	+17	−53
Lalande 44337	6.3	+3.89	+26.7	− 4 03.3	21 52.4	+10 55.2	−0.7544	0.5480	+0.1812	− 8	−90
B. A. C. 7951	6.7	3.90	26.7	4 43.8	**16** 1 15.5	− 9 48.3	+0.5734	0.5484	0.1828	+73	− 3
Lalande 44872	7.0	3.90	26.8	3 45.7	5 41.9	− 5 30.5	+0.3683	0.5489	0.1847	+57	−15
12 Piscium	6.8	3.91	26.5	1 34.0	21 07.0	+ 9 24.8	+0.9481	0.5522	0.1887	+88	+20
13 Piscium	6.4	3.91	26.5	− 1 37.2	22 16.5	+10 32.1	+1.2208	0.5525	0.1889	+88	+43
15 Piscium	6.6	+3.93	+26.4	+ 0 46.7	23 56.5	−11 51.3	−0.9674	0.5529	+0.1891	−21	−90
ↄ Piscium	4.7	3.93	26.2	1 14.9	**17** 3 02.6	− 8 51.1	−0.8683	0.5536	0.1893	−14	−89
21 Piscium	6.1	3.92	26.0	0 32.4	6 30.9	− 5 29.6	+0.5268	0.5545	0.1893	+69	− 6
22 Piscium	5.9	3.94	25.9	2 23.6	7 41.4	− 4 21.4	−1.1784	0.5549	0.1893	−38	−88
25 Piscium	6.3	3.93	25.9	1 33.2	8 12.7	− 3 51.3	−0.2060	0.5550	0.1892	+23	−47
60 Piscium	6.2	3.96	+23.2	+ 6 12.7	**18** 9 16.4	− 3 37.7	−0.3435	0.5628	+0.1824	+16	−54
62 Piscium	6.0	3.97	23.2	6 46.3	9 40.5	− 3 14.4	−0.8453	0.5629	0.1822	−15	−83
δ Piscium	4.8	3.98	23.1	7 03.5	9 51.1	− 3 04.2	−1.1085	0.5630	0.1821	−32	−83
B. A. C. 274	6.2	3.94	22.6	5 57.7	14 54.3	+ 1 48.7	+0.9336	0.5648	0.1793	+90	+20
ε Piscium	4.5	3.96	22.2	7 22.1	16 18.5	+ 3 10.0	−0.2620	0.5653	0.1784	+20	−49
ζ Piscium	5.4	+3.95	+21.6	+ 7 03.8	21 08.3	+ 7 49.9	+0.9051	0.5671	+0.1751	+90	+19
54 Ceti	5.5	3.95	18.5	10 33.8	**19** 13 32.3	− 0 20.5	+0.0825	0.5736	0.1608	+40	−26
B. A. C. 609	6.2	3 96	17.6	11 49.4	17 15.3	+ 3 14.6	−0.6136	0.5751	0.1568	+ 1	−71
ο Arietis	5.8	3.93	13.0	14 54.0	**20** 12 32.3	− 2 10.1	−0.9451	0.5828	0.1323	−21	−75
σ Arietis	5.5	3.90	12.5	14 40.9	15 27.9	+ 0 38.9	−0.3416	0.5839	0.1280	+16	−47
B. A. C. 1119	6.4	+3.80	+ 7.8	+16 13.2	**21** 11 20.9	− 4 12.6	+0.3270	0.5908	+0.0953	+55	− 7
B. A. C. 1206	6.0	3.76	6.1	17 02.3	16 57.2	+ 1 10.9	+0.0051	0.5924	0.0850	+35	−23
B. A. C. 1240	5.7	3.75	5.2	17 55.2	20 03.3	+ 4 09.9	−0.6331	0.5931	0.0791	− 1	−65
B. A. C. 1272	6.3	3.70	4.8	17 04.8	22 59.4	+ 6 59.3	+0.4416	0.5939	0.0737	+64	+ 2
W. B. (2), iv, 248	5.9	3.68	3.1	18.30.5	**22** 3 59.6	+11 48.0	−0.6607	0.5950	0.0640	− 3	−66
δ¹ Tauri	4.0	+3.64	+ 3.3	+17 18.8	5 01.8	−11 12.2	+0.6138	0.5952	+0.0619	+80	+13
δ² Tauri	4.7	3.63	3.2	17 13.1	5 30.0	−10 45.0	+0.7397	0.5953	0.0609	+90	+21
B. A. C. 1361	6.5	3.67	2.6	18 49.1	5 49.3	−10 26.5	−0.8595	0.5954	0.0603	−16	−71
δ³ Tauri	5.0	3 64	2.9	17 42.3	6 03.3	−10 13.0	+0.2807	0.5954	0.0599	+52	− 5
ε Tauri	3.6	3 66	2.2	18 57.9	7 17.8	− 9 01.4	−0.9205	0.5956	0.0574	−20	−71
B. A. C. 1468	6.3	+3 55	+ 0 6	+18 33.5	14 24.8	− 2 10.9	−0.1522	0.5967	+0.0430	+26	−28
ι Tauri	5.2	3.53	+ 0.1	18 40.4	16 27.4	− 0 13.0	−0.1854	0.5970	0.0389	+24	−29
B. A. C. 1563	6.5	3.49	− 1.5	19 40.3	22 07.3	+ 5 13.6	−1.0090	0.5975	0.0268	−28	−70
m Tauri	5.1	3.47	1.2	18 30.8	22 53.1	+ 5 57.7	+0.1830	0.5976	0.0255	+46	− 7
107 Tauri	6.5	3.47	1.8	19 43.9	23 26.7	+ 6 30.0	−1.0363	0.5976	0.0243	−30	−70
B. A. C. 1651	6.5	+3.40	− 2.8	+19 42.9	**23** 4 17.4	+11 09.3	−0.9252	0.5978	+0.0141	−21	−70
115 Tauri	5.4	3.32	2.8	17 52.7	6 48.7	−10 25.3	+0.9623	0.5978	0.0088	+90	+40
119 Tauri	4.6	3.31	3.4	18 31.2	8 49.3	− 8 29.4	+0.3254	0.5978	0.0046	+55	+ 2
120 Tauri	5.3	3 31	3.4	18 28.2	9 20.9	− 7 59.0	+0.3791	0.5978	+0.0031	+59	+ 5
B. A. C. 1796	7.5	3.28	4.7	18 56.3	12 55.4	− 4 32.8	−0.0955	0.5977	−0.0040	+29	−21
127 Tauri	6.3	+3.26	− 4.4	+18 35.9	13 05.4	− 4 23.1	−0.0896	0.5977	−0.0044	+29	−21

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

		The Star's			At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1902.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δa	$\Delta \delta$								
		s	"	° ′	d h m	h m				°	°
130 Tauri	5.5	+3.21	− 4.3	+17 41.5	23 14 55.8	− 2 37.0	+1.1534	0.5976	−0.0082	+90	+56
Lalande 11088	6.1	3.23	5.5	19 50.5	16 52.7	− 0 44.8	−1.0426	0.5974	0.0123	−31	−70
χ² Orionis	5.8	3.21	5.6	19 43.7	17 54.3	+ 0 14.5	−0.9426	0.5974	0.0145	−22	−70
χ³ Orionis	5.1	3.16	6.3	19 41.4	21 19.2	+ 3 31.4	−0.9654	0.5970	0.0216	−24	−70
68 Orionis	5.6	3.12	7.0	19 48.6	24 0 45.7	+ 6 50.0	−1.1736	0.5966	0.0287	−44	−70
71 Orionis	5.1	+3.08	− 7.0	+19 11.3	1 54.7	+ 7 56.3	−0.5775	0.5964	−0.0311	+ 2	−56
Lalande 12148	7.0	3.07	7.0	17 37.2	5 08.8	+11 02.9	+0.8983	0.5959	0.0377	+90	+33
20 Geminorum	6.3	2.95	7.9	17 50.8	8 57.9	− 9 16.8	+0.5107	0.5952	0.0455	+70	+ 9
21 Geminorum	6.5	2.95	7.9	17 51.1	8 58.1	− 9 16.6	+0.5054	0.5952	0.0455	+69	+ 9
22 Geminorum	7.2	2.97	8.6	19 30.1	9 53.4	− 8 23.5	−1.2104	0.5950	0.0474	−51	−70
26 Geminorum	5.0	+2.89	− 8.3	+17 44.3	13 03.5	− 5 20.7	+0.4168	0.5943	−0.0537	+62	+ 3
W.B.(2),vi,1630	5.9	2.77	9.8	17 53.5	21 31.4	+ 2 48.4	−0.2411	0.5925	0.0696	+21	−35
51 Geminorum	5.4	2.67	10.0	16 19.4	25 1 42.4	·+ 6 49.3	+1.0189	0.5910	0.0781	+90	+38
λ Geminorum	3.6	2.65	10.5	16 42.9	3 38.5	+ 8 40.9	+0.4666	0.5904	0.0817	+66	+ 3
W. 7ʰ 685	5.6	2.57	11.5	17 17.6	9 17.1	− 9 53.3	−0.6120	0.5885	0.0919	0	−64
67 Geminorum	7.5	+2.54	−11.3	+15 50.8	9 58.4	− 9 13.5	+0.7947	0.5883	−0.0932	+90	+21
68 Geminorum	5.0	2.54	11.4	16 02.1	10 03.2	− 9 08.8	+0.5963	0.5883	0.0933	+78	+ 9
1 Cancri	5.9	2.41	12.1	16 02.9	19 48.0	+ 0 14.0	−0.4096	0.5848	0.1098	+12	−50
B. A. C. 2649	6.3	2.41	12.4	16 46.8	20 25.9	+ 0 50.6	−1.2228	0.5846	0.1109	−48	−73
12 Cancri	6.3	2.31	11.9	13 55.4	26 0 45.7	+ 5 00.9	+1.1903	0.5830	0.1178	+90	+50
27 Cancri	5.6	+2.21	−12.4	+12 58.5	8 25.7	−11 35.9	+1.2113	0.5800	−0.1292	+90	+51
29 Cancri	5.9	2.21	12.9	14 31.9	9 12.7	−10 50.7	−0.4787	0.5797	0.1303	+ 8	−57
A¹ Cancri	5.6	2.12	12.8	13 01.7	15 29.6	− 4 47.4	+0.2092	0.5772	0.1389	+47	−17
A² Cancri	5.8	2.10	12.8	12 28.0	17 06.8	− 3 13.7	+0.5572	0.5765	0.1411	+73	+ 1
60 Cancri	5.7	2.05	12.9	11 59.8	21 00.9	+ 0 32.1	+0.4773	0.5749	0.1460	+66	− 3
a Cancri	4.3	+2.04	−13.0	+12 14.0	22 07.5	+ 1 36.2	+0.0726	0.5745	−0.1474	+38	−26
κ Cancri	5.1	1.98	12.9	11 03.6	27 2 11.2	+ 5 31.4	+0.6664	0.5729	0.1520	+85	+ 6
ω Leonis	5.6	1.88	12.9	9 28.8	11 20.0	− 9 39.1	+0.8509	0.5693	0.1617	+90	+17
h Leonis	5.4	1.86	13.1	10 08.7	12 53.2	− 8 09.2	−0.0832	0.5687	0.1632	+30	−36
o Leonis	3.8	1.83	13.3	10 20.1	16 59.5	− 4 11.4	−0.9567	0.5671	0.1669	−22	−80
10 Sextantis	6.0	+1.76	−13.1	+ 9 23.7	23 52.2	+ 2 27.1	−1.1588	0.5646	−0.1725	−37	−81
11 Sextantis	6.0	1.76	13.0	8 46.7	28 0 38.1	+ 3 11.4	−0.6573	0.5645	0.1730	− 2	−78
π Leonis	5.0	1.75	13.0	8 30.7	1 35.1	+ 4 06.5	−0.5468	0.5640	0.1737	+ 5	−68
16 Sextantis	6.9	1.72	12.6	6 38.9	5 42.0	+ 8 04.9	+0.6529	0.5626	0.1765	+83	+ 3
43 Leonis	6.5	1.66	12.7	7 02.2	11 59.0	− 9 50.8	−0.8698	0.5605	0.1802	−15	−83
34 Sextantis	6.7	+1.62	−12.0	+ 4 05.5	21 03.0	− 1 05.0	+0.5235	0.5578	−0.1843	+69	− 5
35 Sext. (1ˢᵗ star)	6.2	1.62	12.2	5 15.4	21 22.0	− 0 46.6	−0.7427	0.5577	0.1844	− 7	−82
d Leonis	5.0	+1.58	−11.8	+ 4 08.4	29 5 23.4	+ 6 58.9	−1.0758	0.5555	−0.1868	−29	−86

NEW MOON.

OCTOBER.

λ Virginis	4.7	+1.81	− 4.5	−12 55.3	3 4 23.6	+ 2 56.4	+0.4979	0.5464	−0.1382	+61	− 8
5 Libræ	6.6	+1.92	− 3.3	−15 02.9	17 17.6	− 8 34.3	+1.1178	0.5466	−0.1228	+75	+35
μ Libræ	5.4	1.91	2.8	13 44.5	18 55.5	− 6 59.4	−0.4988	0.5466	0.1208	0	−68
ν¹ Libræ	5.4	2.01	2.2	15 52.7	4 3 12.6	+ 1 01.7	+0.8691	0.5468	0.1100	+74	+16
ν² Libræ	6.9	2.01	2.3	16 06.3	3 18.0	+ 1 07.0	+1.1075	0.5468	0.1096	+74	+35
o¹ Libræ	6.0	2.05	1.1	15 11.7	10 07.5	+ 7 43.5	−0.6031	0.5469	0.1005	− 8	−78
o² Libræ	7.0	+2.05	− 0.9	−14 47.1	11 05.7	+ 8 39.7	−1.1487	0.5469	−0.0992	−47	−90
ζ¹ Libræ	5.7	2.10	1.0	16 22.5	13 34.6	+11 03.9	+0.3475	0.5470	0.0957	+45	−15
ζ² Libræ	7.0	2.11	1.0	17 06.2	14 12.1	+11 40.2	+1.0840	0.5471	0.0948	+73	+33
ζ³ Libræ	6.0	2.10	0.8	16 16.4	14 44.2	−11 48.7	+0.1265	0.5471	0.0940	+32	−27
ζ⁴ Libræ	5.8	2.12	− 0.7	16 31.3	15 48.6	−10 46.4	+0.2970	0.5471	0.0925	+42	−18
θ Libræ	4.3	+2.20	+ 0.8	−16 26.5	5 1 49.1	− 1 05.1	−0.6436	0.5472	−0.0779	−13	−85

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

| | | The Star's | | | | At Conjunction in R. A. | | | | | Limiting Parallels. | |
Name.	Mag.	Red'ns from 1902.0 Δα	Red'ns from 1902.0 Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
49 Libræ	5.6	+2.23	+ 1.3	−16 14.7	5 4 58.4	+ 1 58.1	−1.0993	0.5472	−0.0732	−45	−90
χ Ophiuchi	5.0	2.38	2.5	18 14.0	17 40.6	− 9 44.1	+0.2810	0.5471	0.0537	+37	−19
24 Scorpii	5.5	2.43	3.8	17 33.1	6 0 38.9	− 2 59.2	−0.8072	0.5470	0.0428	−26	−90
29 Ophiuchi	6.8	2.55	4.9	18 44.4	10 19.8	+ 6 23.1	+0.1640	0.5467	−0.0274	+27	−25
B. A. C. 6060	6.5	2.79	8.8	18 46.9	7 12 14.9	+ 7 28.3	+0.0365	0.5453	+0.0140	+18	−32
B. A. C. 6287	5.7	+2.94	+11.3	−18 47.3	8 4 45.5	− 0 32.5	+0.4901	0.5440	+0.0400	+50	− 7
B. A. C. 6294	5.2	2.94	11.5	18 28.0	5 22.2	+ 0 03.0	+0.1597	0.5440	0.0409	+28	−25
ρ¹ Sagittarii	3.9	3.15	15.0	18 01.7	9 5 43.9	− 0 21.7	+1.1199	0.5419	0.0775	+72	+37
υ Sagittarii	4.7	3.12	15.8	16 08.1	5 47.6	− 0 18.0	−0.9617	0.5419	0.0775	−33	−90
e¹ Sagittarii	5.6	3.21	16.8	16 30.8	15 02.5	+ 8 39.4	+0.2340	0.5413	0.0906	+38	−22
e² Sagittarii	5.0	+3.21	+16.9	−16 20.9	15 55.3	+ 9 30.5	+0.1335	0.5412	+0.0918	+32	−27
B. A. C. 6746	5.5	3.21	17.2	15 41.6	16 26.1	+10 00.3	−0.5403	0.5412	0.0925	− 5	−73
g Sagittarii	5.0	3.25	17.9	15 44.8	23 28.5	− 7 10.5	+0.2040	0.5391	0.1018	+37	−23
B. A. C. 6992	6.2	3.34	19.5	15 05.3	10 10 39.9	+ 3 39.9	+0.7061	0.5403	0.1165	+74	+ 6
β Capricorni	3.4	3.34	19.5	15 05.1	10 46.8	+ 3 46.6	+0.7162	0.5403	0.1167	+75	+ 7
B. A. C. 7087	6.2	+3.38	+20.5	−14 03.1	17 15.6	+10 03.2	+0.3692	0.5401	+0.1246	+50	−14
B. A. C. 7221	6.3	3.42	21.7	12 54.1	11 1 22.7	− 6 05.1	+0.1671	0.5401	0.1340	+39	−25
B. A. C. 7242	6.5	3.42	22.1	11 56.3	2 34.5	− 4 55.5	−0.7177	0.5401	0.1354	−11	−90
ν Aquarii	4.6	3.48	22.8	11 45.7	10 40.6	+ 2 55.5	+0.2252	0.5403	0.1441	+43	−22
17 Aquarii	6.4	3.51	23.9	9 43.8	17 15.5	+ 9 18.0	−0.9967	0.5406	0.1508	−27	−90
19 Aquarii	5.7	+3.52	+23.8	−10 09.6	18 22.1	+11 22.5	+0.3658	0.5407	+0.1518	+11	−57
B. A. C. 7562	5.5	3.58	24.6	9 28.8	12 4 01.8	− 4 15.9	+0.4146	0.5415	0.1607	+57	−12
c¹ Capricorni	5.2	3.58	24.6	9 31.6	4 04.3	− 4 13.5	+0.4700	0.5415	0.1607	+61	− 9
c² Capricorni	6.2	3.58	24.5	9 43.3	4 41.3	− 3 37.7	+0.7789	0.5416	0.1611	+80	+ 9
30 Aquarii	5.6	3.61	25.6	6 59.3	13 01.1	+ 4 26.4	−0.7710	0.5426	0.1680	−10	−90
B. A. C. 7704	7.3	+3.64	+25.9	− 6 18.0	15 10.8	+ 6 32.0	−1.1391	0.5429	+0.1696	−37	−90
B. A. C. 7717	6.9	3.65	25.5	8 00.1	16 02.5	+ 7 22.0	+0.8188	0.5431	0.1702	+82	+12
44 Aquarii	5.9	3.67	26.1	5 52.2	19 45.9	+10 58.4	−0.8104	0.5437	0.1728	−12	−90
51 Aquarii	5.8	3.69	26.3	5 19.6	23 10.1	− 9 43.8	−0.7937	0.5443	0.1750	−11	−90
κ Aquarii	5.5	3.73	26.5	4 43.6	13 5 46.6	− 3 19.9	−0.2566	0.5457	0.1786	+20	−50
Lalande 44337	6.3	+3.74	+26.7	− 4 03.3	7 14.5	− 1 54.7	−0.7018	0.5460	+0.1797	− 5	−88
B. A. C. 7951	6.7	3.76	26.5	4 43.8	10 38.4	+ 1 22.6	+0.6230	0.5468	0.1814	+77	0
Lalande 44872	7.0	3.79	26.7	3 45.7	15 05.3	+ 5 41.0	+0.4138	0.5479	0.1834	+60	−12
12 Piscium	6.8	3.88	26.7	1 34.0	14 6 29.5	− 3 24.7	+0.9772	0.5525	0.1880	+88	+22
13 Piscium	6.4	3.89	26.6	− 1 37.2	7 38.8	− 2 17.6	+1.2485	0.5529	0.1882	+88	+47
15 Piscium	6.6	+3.91	+26.9	+ 0 46.7	9 18.4	− 0 41.4	−0.9344	0.5535	+0.1884	−19	−89
λ Piscium	4.7	3.92	26.8	1 14.9	12 23.5	+ 2 17.7	−0.8382	0.5546	0.1887	−13	−89
21 Piscium	6.1	3.94	26.5	0 32.4	15 50.7	+ 5 38.1	+0.5489	0.5559	0.1889	+71	− 5
22 Piscium	5.9	3.96	26.7	2 23.6	17 00.7	+ 6 45.8	−1.1504	0.5563	0.1889	−36	−88
25 Piscium	6.3	3.96	26.5	1 33.2	17 31.8	+ 7 15.8	−0.1823	0.5565	0.1889	+24	−45
60 Piscium	6.2	+4.13	+24.5	+ 6 12.8	15 18 18.2	+ 7 12.1	−0.3390	0.5673	+0.1832	+16	−54
62 Piscium	6.0	4.14	24.5	6 46.3	18 41.8	+ 7 34.8	−0.8377	0.5674	0.1829	−13	−83
δ Piscium	4.8	4.15	24.5	7 03.5	18 52.3	+ 7 45.0	−1.0087	0.5675	0.1828	−32	−83
B. A. C. 274	6.2	4.14	23.8	5 57.7	23 50.5	−11 27.1	+0.9230	0.5699	0.1802	+90	+19
ε Piscium	4.5	4.17	23.6	7 22.1	16 1 13.2	−10 07.4	−0.2635	0.5706	0.1793	+20	−48
ζ Piscium	5.4	+4.19	+22.9	+ 7 03.8	5 57.7	− 5 32.8	+0.8898	0.5729	+0.1762	+90	+17
54 Ceti	5.5	4.29	20.3	10 33.8	22 00.6	+ 9 55.6	+0.0632	0.5810	0.1621	+37	−27
B. A. C. 609	6.2	4.33	19.5	11 49.5	17 1 38.2	−10 34.6	−0.6278	0.5828	0.1582	0	−72
o Arietis	5.8	4.42	15.1	14 54.1	20 25.1	+ 7 30.5	−0.9649	0.5918	0.1337	−22	−75
σ Arietis	5.5	4.41	14.3	14 40.9	23 16.1	+10 14.9	−0.3700	0.5930	0.1294	+14	−49
B. A. C. 1119	6.4	+4.39	+ 9.1	+16 13.2	18 18 35.0	+ 4 49.2	+0.2814	0.6003	+0.0964	+52	− 9
B. A. C. 1206	6.0	4.40	7.6	17 02.3	19 0 01.7	+10 03.0	−0.0387	0.6019	0.0861	+32	−25
B. A. C. 1240	5.7	4.41	6.6	17 55.2	3 02.6	−11 03.2	−0.6690	0.6026	0.0802	− 4	−68
B. A. C. 1272	6.3	4.36	6.0	17 04.7	5 53.7	− 8 18.8	+0.3909	0.6033	0.0745	+60	0
W.B.(2),iv,248	5.9	4.37	4.3	18 30.5	10 45.6	− 3 38.5	−0.6989	0.6042	0.0646	− 5	−70
δ¹ Tauri	4.0	+4.33	+ 4.4	+17 18.8	11 46.1	− 2 40.4	+0.5595	0.6044	+0.0626	+74	+10

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

		THE STAR'S				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1902.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'		N.	S.
		Δα	Δδ									
		s	"	° '	d h m	h m					°	°
δ² Tauri	4.7	+4.32	+ 4.2	+17 13.1	19 12 13.5	− 2 14.1	+0.6839	0.6044	+0.0616		+90	+18
B. A. C. 1361	6.5	4.37	3.8	18 39.1	12 32.3	− 1 56.0	−0.8958	0.6045	0.0610		−18	−71
δ³ Tauri	5.0	4.33	4.0	17 42.3	12 46.0	− 1 42.8	+0.2302	0.6045	0.0605		+50	−10
ε Tauri	3.6	4.36	3.4	18 57.8	13 58.5	− 0 33.2	−0.9565	0.6047	0.0580		−23	−71
B. A. C. 1468	6.3	4.29	1.5	18 33.5	20 54.2	+ 6 05.9	−0.1991	0.6055	0.0434		+23	−31
i Tauri	5.2	+4.28	+ 1.0	+18 40.4	22 53.7	+ 8 00.8	−0.2323	0.6055	+0.0391		+21	−32
B. A. C. 1563	6.5	4.25	− 0.8	19 40.3	20 4 25.2	−10 41.0	−1.0479	0.6057	0.0272		−31	−70
m Tauri	5.1	4.23	0.8	18 30.8	5 09.8	− 9 58.2	+0.1308	0.6056	0.0256		+42	−11
107 Tauri	6.5	4.24	1.2	19 43.9	5 42.6	− 9 26.7	−1.0752	0.6056	0.0244		−33	−70
B. A. C. 1651	6.5	4.19	2.3	19 42.9	10 26.7	− 4 53.9	−0.9663	0.6054	0.0142		−24	−70
115 Tauri	5.4	+4.09	− 2.7	+17 52.7	12 54.6	− 2 31.9	+0.9014	0.6052	+0.0090		+90	+36
119 Tauri	4.6	4.09	3.3	18 31.2	14 52.5	− 0 38.7	+0.2707	0.6050	0.0046		+51	− 1
120 Tauri	5.3	4.09	3.4	18 28.2	15 23.5	− 0 09.0	+0.3239	0 6049	+0.0035		+55	+ 2
B. A. C. 1796	7.5	4.08	4.7	18 56.3	18 53.5	+ 3 12.8	−0.1463	0.6044	−0.0041		+26	−24
127 Tauri	6.3	4.06	4.5	18 55.9	19 03.4	+ 3 22.3	−0.1404	0.6044	0.0045		+26	−24
130 Tauri	5.5	+4.01	− 4.6	+17 41.5	20 51.5	+ 5 06.1	+1.0004	0.6042	−0.0084		+90	+50
Lalande 11088	6.1	4.04	5.7	19 50.5	22 46.2	+ 6 56.2	−1.0848	0.6037	0.0125		−34	−70
χ² Orionis	5.8	4.02	5.9	19 43.7	23 46.7	+ 7 54.4	−0.9865	0.6035	0.0146		−26	−70
χ³ Orionis	5.1	3.98	6.7	19 41.4	21 3 07.8	+11 07.4	−1.0094	0.6028	0.0218		−28	−70
68 Orionis	5.6	3.94	· 7.5	19 48.6	6 30.8	− 9 37.5	−1.2164	0.6019	0.0290		−50	−70
71 Orionis	5.1	+3.90	− 7.7	+19 11.2	7 38.7	− 8 32.3	−0.6251	0.6016	−0.0314		− 1	−60
Lalande 12148	7.0	3.81	7.9	17 37.2	10 49.8	− 5 28.8	+0.8403	0.6007	0.0380		+90	+29
20 Geminorum	6.3	3.76	8.8	17 50.8	14 35.6	− 1 51.8	+0.4553	0.5995	0.0458		+65	+ 6
21 Geminorum	6.5	3.76	8.8	17 51.1	14 36.0	− 1 51.5	+0.4500	0.5995	0.0458		+65	+ 6
22 Geminorum	7.2	3.80	9.6	19 30.1	15 30.5	− 0 59.1	−1.2545	0.5991	0.0477		−58	−70
26 Geminorum	5.0	+3.71	− 9.7	+17 44.3	18 38.2	+ 2 01.4	+0.3624	0.5981	−0.0540		+58	0
W.B.(2),vi,1630	5.9	3.59	11.4	17 53.5	22 2 41.6	+ 9 46.0	−0.2914	0.5949	0.0698		+18	−38
51 Geminorum	5.4	3.48	11.6	16 19.3	7 09.8	− 9 55.9	+0.9637	0.5930	0.0783		+90	+34
λ Geminorum	3.6	3.46	12.2	16 42.8	9 05.2	− 8 05.0	+0.4140	0.5921	0.0818		+61	0
W. 7ʰ, 685	5.6	3.38	13.3	17 17.6	14 42.0	− 2 41.0	−0.6596	0.5895	0.0919		− 3	−68
67 Geminorum	7.5	+3.35	−13.0	+15 50.8	15 23.1	− 2 01.4	+0.7426	0.5892	−0.0931		+90	+18
68 Geminorum	5.0	3.35	13.0	16 02.0	15 28.0	− 1 56.7	+0.5445	0.5892	0.0933		+73	+ 6
1 Cancri	5.9	3.20	14.5	16 02.9	23 1 11.6	+ 7 25.1	−0.4577	0.5844	0.1096		+ 9	−53
B. A. C. 2649	6.3	3.21	14.8	16 46.6	1 49.5	+ 8 01.5	−1.2699	0.5841	0.1106		−57	−73
12 Cancri	6.3	3.09	14.4	13 55.3	6 09.6	−11 47.9	+1.1425	0.5819	0.1173		+90	+45
27 Cancri	5.6	+2.97	−15.0	+12 58.4	13 51.0	− 4 23.3	+1.1668	0.5779	−0.1285		+90	+49
29 Cancri	5.9	2.98	15.6	14 31.9	14 38.4	− 3 37.7	−0.5251	0.5775	0.1296		+ 6	−61
A¹ Cancri	5.6	2.86	15.7	13 01.7	20 57.7	+ 2 28.0	+0.1650	0.5743	0.1380		+44	−19
A² Cancri	5.8	2.83	15.6	12 27.9	22 35.5	+ 4 02.3	+0.5151	0.5735	0.1401		+69	− 1
60 Cancri	5.7	2.77	15.8	11 59.8	24 2 31.7	+ 7 50.2	+0.4353	0.5715	0.1448		+62	− 6
a Cancri	4.3	+2.76	−16.0	+12 14.0	3 38.8	+ 8 54.9	+0.5709	0.5709	−0.1462		+36	−28
κ Cancri	5.1	2.69	15.9	13 03.5	7 44.9	−11 07.5	+0.6275	0.5690	0.1508		+80	+ 4
ω Leonis	5.6	2.56	15.9	9 28.8	17 00.3	− 2 11.4	+0.8157	0.5641	0.1601		+90	+15
h Leonis	5.4	2.54	16.2	10 08.6	18 34.7	− 0 40.2	−0.1223	0.5639	0.1614		+28	−38
o Leonis	3.8	2.49	16.5	10 20.0	22 44.5	+ 3 21.0	−0.9992	0.5619	0.1651		−24	−80
10 Sextantis	6.0	+2.40	−16.3	+ 9 23.6	25 5 43.4	+10 05.7	−1.2008	0.5591	−0.1704		−42	−81
11 Sextantis	6.0	2.39	16.2	8 46.6	6 30.2	+10 51.0	−0.6964	0.5588	0.1710		− 4	−81
π Leonis	5.0	2.38	16.2	8 30.6	7 28.0	+11 46.8	−0.5846	0.5584	0.1717		+ 1	−73
16 Sextantis	6.9	2.32	15.6	6 38.8	11 39.1	− 8 10.5	+0.6236	0.5568	0.1746		+78	+ 1
43 Leonis	6.5	2.24	15.8	7 02.1	18 02.7	− 1 59.6	−0.9073	0.5546	0.1779		· 18	−83
34 Sextantis	6.7	+2.16	−14.8	+ 4 05.5	26 3 16.8	+ 6 56.2	+0.4987	0.5516	−0.1819		+67	− 7
35 Sext. (1ˢᵗ star)	6.2	2.15	15.2	5 15.4	3 36.1	+ 7 15.0	−0.7767	0.5514	0.1820		− 9	−85
d Leonis	5.0	2.07	14.7	4 08.4	11 46.7	− 8 50.4	−1.1101	0.5492	0.1844		−32	−86
ϕ³ Leonis	6.2	2.06	14.2	2 29.0	14 49.9	− 5 53.1	+0.0608	0.5485	0.1849		+38	−31
75 Leonis	5.4	2.01	14.0	2 32.7	19 46.8	− 1 05.7	−0.9215	0.5474	0.1856		− 18	−87
76 Leonis	6.3	+2.01	−13.9	+ 2 11.0	20 33.9	− 0 20.1	−0.6876	0.5472	−0.1857		− 3	−85

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

Name.	Mag.	Red'ns from 1902.0 Δα	Red'ns from 1902.0 Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
79 Leonis	5.5	+1.99	-13.7	+ 1 56.5	26 23 01.7	+ 2 03.0	-0.8911	0.5468	-0.1858	-16	-88
ν Leonis	4.4	1.96	12.9	- 0 17.2	27 5 15.3	+ 8 04.8	+0.2969	0.5457	0.1858	+53	-18
B. A. C. 4134	6.0	1.86	11.1	3 24.8	28 1 15.3	+ 3 26.8	-0.0796	0.5435	0.1818	+30	-39
B. A. C. 4200	5.7	1.84	10.6	4 04.6	5 59.3	+ 8 01.8	-0.2307	0.5433	0.1799	+21	-48
B. A. C. 4225	6.3	1.84	10.4	4 30.9	7 49.9	+ 9 49.0	-0.0944	0.5433	0.1791	+29	-40
f Virginis	5.9	+1.84	-10.0	- 5 17.7	10 20.3	-11 45.3	+0.2883	0.5432	-0.1779	+51	-19

NEW MOON.

NOVEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
χ Ophiuchi	5.0	+2.13	+ 3.2	-18 14.0	2 1 24.1	- 0 12.9	+0.2727	0.5493	-0.0516	+36	-19
24 Scorpii	5.5	2.14	4.3	17 33.1	8 21.2	+ 6 30.8	-0.8178	0.5492	0.0431	-27	-90
29 Ophiuchi	6.8	2.22	5.4	18 44.4	18 00.3	- 8 08.7	+0.1529	0.5488	-0.0277	+26	-26
B. A. C. 6060	6.5	+2.39	+ 9.1	-18 46.9	3 19 52.7	- 7 06.1	+0.0212	0.5463	+0.0138	+17	-33
B. A. C. 6287	5.7	2.51	11.3	18 47.3	4 12 24.4	+ 8 54.1	+0.4714	0.5442	0.0398	+49	- 8
B. A. C. 6294	5.2	2.51	11.4	18 28.0	13 01.1	+ 9 20.6	+0.1401	0.5442	0.0407	+27	-26
ν¹ Sagittarii	3.9	2.68	14.6	18 01.7	5 13 30.5	+ 9 13 4	+1.0993	0.5403	0.0770	+72	+35
ν Sagittarii	4.7	2.67	15.2	16 08.1	13 34.3	+ 9 16.4	-0.9925	0.5402	0.0771	-35	-90
ε¹ Sagittarii	5.6	+2.74	+16.1	-16 30.8	22 54.1	- 5 41.2	+0.2071	0.5388	+0.0900	+36	-23
ε² Sagittarii	5.0	2.74	16.2	16 21.0	23 47.4	- 4 49.6	+0.1057	0.5388	0.0912	+30	-29
B. A. C. 6746	5.5	2.74	16.5	15 41.6	6 0 18.7	- 4 19.2	-0.5725	0.5383	0.0919	- 7	-75
ξ Sagittarii	5.0	2.80	17.2	15 44.8	7 25.8	+ 2 34.6	+0.1752	0.5375	0.1013	+36	-25
B. A. C. 6992	6.2	2.88	18.5	15 05.3	18 46.4	-10 25.8	+0.6790	0.5361	0.1154	+73	+ 4
β Capricorni	3.4	+2.88	+18.5	-15 05.2	18 53.4	- 6 19.2	+0.6891	0.5361	+0.1156	+74	+ 4
B. A. C. 7087	6.2	2.92	19.4	14 03.2	7 1 28.3	- 3 56.3	+0.3390	0 5354	0.1233	+48	-16
B. A. C. 7221	6.3	2.98	20.5	12 54.1	9 43.8	+ 4 00 0	+0.1339	0.5348	0.1326	+36	-27
B. A. C. 7242	6.5	2.98	20.9	11 56.3	10 56.6	+ 5 10.5	-0.7589	0.5347	0.1339	-13	-90
ν Aquarii	4.6	3.05	21.5	11 45.8	19 12.0	-10 45.2	+0.1908	0.5344	0.1424	+42	-24
17 Aquarii	6.4	+3.09	+22.6	- 9 43.9	8 1 54.8	- 4 14.8	-1.0423	0.5344	+0.1489	-31	-90
19 Aquarii	5.7	3.10	22.5	10 09.6	3 02.8	- 3 08.9	-0.4066	0.5343	0.1499	+ 9	-61
B. A. C. 7562	5.5	3.18	23.2	9 28.9	12 54.8	+ 6 25.0	+0.3807	0.5348	0.1586	+55	-14
c¹ Capricorni	5.2	3.18	23.2	9 31.6	12 57.3	+ 6 27.4	+0.4365	0.5348	0.1586	+59	-11
c² Capricorni	6.2	3.19	23.1	9 43.3	13 35.2	+ 7 04.2	+0.7483	0.5348	0.1592	+77	+ 7
30 Aquarii	5.6	+3.23	+24.2	- 6 59.4	22 06.0	- 8 40.7	-0.8156	0.5356	+0.1658	-14	-90
B. A. C. 7704	7.3	3.27	24.6	6 18.0	9 0 18.6	- 6 32.1	-0.1187	0.5359	0.1674	+26	-41
B. A. C. 7717	6.9	3.28	24.2	8 00.1	1 11 4	- 5 40.9	+0.7889	0.5360	0.1680	+82	+10
44 Aquarii	5.9	3.31	24.8	5 52.2	4 59.7	- 1 59.8	-0.8553	0.5365	0.1706	-15	-90
51 Aquarii	5.8	3.34	25.0	5 19.6	8 28.5	+ 1 22.6	-0.8384	0.5371	0.1728	-14	-90
κ Aquarii	5.5	+3.40	+25.3	- 4 43.6	15 13.8	+ 7 56.3	-0.2960	0.5385	+0.1766	+17	-52
Lalande 44337	6.3	3.42	25.5	4 03.3	16 43.6	+ 9 22.3	-0.7452	0.5389	0.1774	- 7	-90
B. A. C. 7951	6.7	3.45	25.2	4 43.8	20 11.9	-11 15.9	+0.5915	0.5397	0.1792	+74	- 2
Lalande 44872	7.0	3.45	25.5	3 45.7	10 0 44.6	- 6 51.7	+0.3028	0.5409	0.1812	+52	-18
12 Piscium	6.8	3.65	25.6	1 34.1	16 27.1	+ 8 21.0	-0.9509	0.5463	0.1861	+88	+20
13 Piscium	6.4	+3.66	+25.6	- 1 37.2	17 37.7	+ 9 29.4	+1.2238	0.5466	+0.1862	+88	+44
15 Piscium	6.6	3.69	26.1	+ 0 46.7	19 19.1	+11 07.5	-0.9730	0.5473	0.1865	-21	-89
λ Piscium	4.7	3.72	26.0	1 14.9	22 27.5	- 9 50.1	-0.8748	0.5486	0.1869	-15	-89
21 Piscium	6.1	3.75	25.7	0 32.4	11 1 58.0	- 6 26.5	+0.5209	0.5501	0.1872	+69	- 6
22 Piscium	5.9	3.78	26.0	2 23.6	3 09.2	- 5 17.6	-1.1869	0.5506	0.1873	-40	-88
25 Piscium	6.3	+3.78	+25.8	+ 1 33.2	3 40.7	- 4 47.2	-0.2139	0.5509	+0.1873	+23	-47
60 Piscium	6.2	4.07	24.3	6 12.8	12 4 44.7	- 4 33.2	-0.3607	0.5641	0.1825	+15	-55
62 Piscium	6.0	4.08	24.3	6 46.3	5 08.6	- 4 10.2	-0.8596	0.5643	0.1823	-14	-83
δ Piscium	4.8	4.09	24.4	7 03.5	5 19.2	- 3 59.9	-1.1210	0.5645	0.1823	-33	-83
B. A. C. 274	6.2	4.12	23.5	5 57.7	10 19.1	+ 0 49.7	+0.9054	0.5675	0.1798	+90	+18
ε Piscium	4.5	+4.16	+23.5	+ 7 22.1	11 42.3	+ 2 09.9	-0.2812	0.5683	+0.1791	+19	-50

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

Name.	Mag.	Red'ns from 1902.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	Limiting Parallels.	
		Δα	Δδ							N.	S.
		s	"	° '	d h m	h m				°	°
ζ Piscium	5.4	+4.20	+22.7	+ 7 03.8	12 16 27.8	+ 6 45.5	+0.8740	0.5713	+0.1762	+90	+17
54 Ceti	5.5	4.40	20.4	10 33.8	13 8 29.8	− 1 47.0	+0.0562	0.5816	0.1629	+38	−28
B. A. C. 609	6.2	4.46	19.8	11 49.5	12 06.3	+ 1 41.6	−0.6299	0.5840	0.1592	0	−72
o Arietis	5.8	4.67	15.7	14 54.1	14 6 41.7	− 4 24.9	−0.9503	0.5956	0.1353	−22	−75
σ Arietis	5.5	4.68	15.0	14 40.9	9 29.8	− 1 43.0	−0.3587	0.5975	0.1311	−15	−49
B. A. C. 1119	6.4	+4.80	+ 9.7	+16 13.2	15 4 26.1	− 7 31.7	+0.2995	0.6077	+0.0983	+53	− 9
B. A. C. 1206	6.0	4.84	8.0	17 02.3	9 44.9	− 2 25.7	−0.0131	0.6099	0.0879	+34	−24
B. A. C. 1240	5.7	4.87	7.1	17 55.2	12 41.1	+ 0 23.4	−0.6337	0.6111	0.0820	− 1	−66
B. A. C. 1272	6.3	4.84	6.3	17 04.8	15 27.5	+ 3 03.0	+0.4147	0.6121	0.0763	+62	+ 1
W.B.(2),iv,248	5.9	4.89	4.6	18 30.6	20 11.4	+ 7 35.3	−0.6569	0.6135	0.0664	− 3	−66
δ¹ Tauri	4.0	+4.85	+ 4.5	+17 18.8	21 10.1	+ 8 31.7	+0.5848	0.6138	+0.0642	+76	+12
δ² Tauri	4.7	4.84	4.4	17 13.1	21 36.7	+ 8 57.3	+0.7075	0.6139	0.0633	+90	+19
B. A. C. 1361	6.5	4.90	4.1	18 49.1	21 54.9	+ 9 14.6	−0.8503	0.6140	0.0626	−15	−72
δ³ Tauri	5.0	4.86	4.2	17 42.3	22 08.2	+ 9 27.3	+0.2610	0.6141	0.0622	+51	− 7
ε Tauri	3.6	4.91	3.6	18 57.9	23 18.6	+10 34.9	−0.9086	0.6143	0.0596	−19	−71
B. A. C. 1468	6.3	+4.87	+ 1.6	+18 33.5	16 6 01.7	− 6 58.6	−0.1571	0.6158	+0.0448	+26	−28
i Tauri	5.2	4.87	+ 0.9	18 40.4	7 57.3	− 5 07.7	−0.1885	0.6161	0.0405	+24	−29
B. A. C. 1563	6.5	4.88	− 0.9	19 40.3	13 18.1	− 0 00.2	−0.9877	0.6164	0.0284	−26	−70
m Tauri	5.1	4.86	0.9	18 30.8	14 01.2	+ 0 41.1	+0.1733	0.6165	0.0268	+45	− 8
107 Tauri	6.5	4.87	1.3	19 43.9	14 33.0	+ 1 11.6	−1.0137	0.6166	0.0256	−28	−70
B. A. C. 1651	6.5	+4.86	− 2.8	+19 52.9	19 07.6	+ 5 34.8	−0.9032	0.6166	+0.0152	−19	−70
115 Tauri	5.4	4.77	3.2	17 52.6	21 30.5	+ 7 51.8	+0.9367	0.6165	0.0097	+90	+38
119 Tauri	4.6	4.78	3.9	18 31.2	23 24.3	+ 9 40.9	+0.3173	0.6163	0.0053	+55	+ 2
120 Tauri	5.3	4.77	3.9	18 28.2	23 54.2	+10 09.6	+0.3698	0.6163	+0.0041	+59	+ 5
B. A. C. 1796	7.5	4.79	5.4	18 56.3	17 3 17.0	−10 35.9	−0.0905	0.6159	−0.0036	+29	−21
127 Tauri	6.3	+4.76	− 5.3	+18 55.9	3 26.5	−10 26.8	−0.0846	0.6159	−0.0039	+30	−20
130 Tauri	5.5	4.70	5.5	17 41.5	5 10.9	− 8 46.6	+1.1279	0.6156	0.0079	+90	+54
Lalande 11088	6.1	4.76	6.3	19 50.5	7 01.6	− 7 00.5	−1.0118	0.6153	0.0121	−28	−70
χ² Orionis	5.8	4.75	6.8	19 43.7	7 59.9	− 6 04.6	−0.9139	0.6152	0.0143	−21	−70
χ³ Orionis	5.1	4.72	7.7	19 41.4	11 14.0	− 2 58.6	−0.9343	0.6143	0.0216	−22	−70
68 Orionis	5.6	+4.69	− 8.7	+19 48.6	14 29.9	+ 0 09.4	−1.1360	0.6134	−0.0289	−40	−70
71 Orionis	5.1	4.66	8.9	19 11.2	15 35.4	+ 1 12.2	−0.5536	0.6132	0.0314	+ 3	−54
Lalande 12148	7.0	4.57	9.5	17 37.2	18 39.7	+ 4 08.9	+0.8893	0.6122	0.0382	+90	+33
20 Geminorum	6.3	4.54	10.5	17 50.7	22 17.7	+ 7 38.1	+0.5133	0.6109	0.0461	+70	+ 9
21 Geminorum	6.5	4.54	10.5	17 51.0	22 17.9	+ 7 38.3	+0.5082	0.6109	0.0461	+70	+ 9
22 Geminorum	7.2	+4.58	−11.2	+19 30.1	23 10.6	+ 8 28.8	−1.1682	0.6106	−0.0480	−43	−71
26 Geminorum	5.0	4.49	11.5	17 44.3	18 2 11.8	+11 22.7	+0.4245	0.6093	0.0545	+63	+ 3
W.B.(2),vi,1630	5.9	4.40	13.5	17 53.5	9 58.6	− 5 09.4	−0.2143	0.6057	0.0706	+23	−34
51 Geminorum	5.4	4.30	14.1	16 19.3	14 17.8	− 1 00.4	+1.0236	0.6035	0.0792	+90	+39
λ Geminorum	3.6	4.29	14.6	16 42.8	16 09.4	+ 0 46.8	+0.4835	0.6025	0.0828	+67	+ 4
W. 7ʰ 685	5.6	+4.23	−15.9	+17 17.5	21 35.4	+ 5 59.9	−0.5720	0.5995	−0.0931	+ 2	−60
67 Geminorum	7.5	4.18	15.8	15 50.7	22 15.2	+ 6 38.3	+0.8106	0.5990	0.0942	+90	+22
68 Geminorum	5.0	4.19	15.8	16 02.0	22 19.9	+ 6 42.8	+0.6156	0.5990	0.0944	+80	+10
1 Cancri	5.9	4.05	17.6	16 02.8	19 7 45.8	− 8 13.1	− 0.3676	0.5934	0.1109	+14	−47
B. A. C. 2649	6.3	4.06	17.9	16 46.7	8 22.6	− 7 37.8	−1.1686	0.5929	0.1119	−41	−73
5 Cancri	6.3	+4.04	−18.1	+16 43.2	9 35.7	− 6 27.4	−1.2493	0.5921	−0.1139	−53	−73
12 Cancri	6.3	3.94	17.8	13 55.3	12 35.3	− 3 34.6	+1.2133	0.5902	0.1187	+90	+53
27 Cancri	5.6	3.82	18.7	12 58.4	20 04.6	+ 3 37.8	+1.2410	0.5854	0.1299	+90	+55
29 Cancri	5.9	3.83	19.2	14 31.8	20 50.7	+ 4 22.1	−0.4295	0.5848	0.1310	+11	−54
A¹ Cancri	5.6	3.71	19.6	13 01.6	20 3 00.8	+10 18.6	+0.2546	0.5808	0.1393	+50	−15
A² Cancri	5.8	+3.68	−19.6	+12 27.9	4 36.6	+11 50.9	+0.6004	0.5798	−0.1414	+77	+ 4
60 Cancri	5.7	3.62	19.9	11 59.7	8 27.5	− 8 26.6	+0.5239	0.5773	0.1461	+70	− 1
α Cancri	4.3	3.61	20.1	12 13.9	9 33.3	− 7 23.2	+0.1230	0.5766	0.1474	+42	−23
κ Cancri	5.1	3.53	20.1	11 03.4	13 34.6	− 3 30.5	+0.7155	0.5740	0.1519	+90	+10
ω Leonis	5.6	3.39	20.3	9 28.7	22 40.5	+ 5 16.1	+0.9049	0.5684	0.1611	+90	+21
h Leonis	5.4	+3.38	−20.6	+10 08.5	21 0 13.4	+ 6 45.7	−0.0247	0.5675	−0.1625	+33	−32

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

		The Star's				At Conjunction in R. A.				Limiting Parallels	
Name.	Mag.	Red'ns from 1902.0		Apparent Declination.	Washington Mean Time..	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° '	d h m	h m				°	°
o Leonis	3.8	+3.31	−20.8	+10 19.9	21 4 19.8	+10 43.6	−0.8951	0.5651	−0.1660	−17	−80
10 Sextantis	6.0	3.21	20.7	9 23.5	11 13.8	− 6 36.6	−1.0958	0.5612	0.1712	−32	−81
11 Sextantis	6.0	3.20	20.6	8 46.6	12 00.1	− 5 51.8	−0.5948	0.5608	0.1717	+ 1	−72
π Leonis	5.0	3.18	20.6	8 30.5	12 57.4	− 4 56.5	−0.4840	0.5603	0.1723	+ 8	−63
16 Sextantis	6.9	3.12	20.2	6 38.7	17 06.2	− 0 56.1	+0.7179	0.5582	0.1749	+90	+ 7
43 Leonis	6.5	+3.04	−20.3	+ 7 02.1	23 27.2	+ 5 12.2	−0.8060	0.5550	−0.1783	−11	−83
34 Sextantis	6.7	2.93	19.4	4 05.4	22 8 39.2	− 9 54.0	+0.5936	0.5510	0.1820	+75	− 1
35 Sext. (1st star)	6.2	2.92	19.7	5 15.3	8 58.5	− 9 35.2	−0.6753	0.5508	0.1821	− 3	−82
d Leonis	5.0	2.82	19.1	4 08.3	17 08.9	− 1 40.8	−1.0139	0.5477	0.1841	−25	−86
ρ³ Leonis	6.2	2.80	18.6	2 28.9	20 12.4	+ 1 16.8	+0.1543	0.5465	0.1847	+44	−26
75 Leonis	5.4	+2.74	−18.5	+ 2 32.6	23 1 10.2	+ 6 05.1	−0.8291	0.5451	−0.1852	−12	−88
76 Leonis	6.3	2.73	18.2	2 10.9	1 57.5	+ 6 50.8	−0.5959	0.5449	0.1853	+ 2	−75
79 Leonis	5.5	2.71	18.0	+ 1 56.4	4 25.8	+ 9 14.4	−0.8002	0.5442	0.1855	−10	−88
υ Leonis	4.4	2.66	17.2	− 0 17.3	10 41.5	− 8 41.7	+0.3854	0.5426	0.1852	+58	−13
B. A. C. 4134	6.0	2.49	14.8	3 24.8	24 6 52.0	+10 50.9	−0.0024	0.5392	0.1809	+34	−35
B. A. C. 4200	5.7	+2.46	−14.2	− 4 04.6	11 39.3	− 8 30.8	−0.1575	0.5388	−0.1791	+25	−44
B. A. C. 4225	6.3	2.45	14.0	4 31.0	13 31.1	− 6 42.6	−0.0211	0.5387	0.1783	+33	−36
f Virginis	5.9	2.44	13.5	5 46.1	16 03.4	− 4 14.8	+0.3602	0.5385	0.1772	+56	−15
B. A. C. 4294	6.1	2.41	12.9	5 17.7	21 22.4	+ 0 54.3	−0.0686	0.5384	0.1745	+30	−38
B. A. C. 4394	5.9	2.37	11.3	8 27.7	25 7 44.3	+10 57.2	−1.0468	0.5384	0.1683	+82	+28
h Virginis	5.5	+2.31	− 9.6	− 9 39.8	19 48.3	− 1 21.4	+0.3665	0.5391	−0.1594	+54	−15
B. A. C. 4591	6.3	2.27	8.7	9 13.3	26 2 50.5	+ 5 27.6	−1.2135	0.5397	0.1534	−47	−90
λ Virginis	4.7	2.25	6.3	12 55.3	18 28.7	− 3 23.3	+0.5225	0.5416	0.1381	+62	− 6
5 Libræ	6.6	+2.24	−4.3	−15 02.9	27 7 34.4	+ 9 17.7	+1.1323	0.5435	−0.1232	+75	+37

NEW MOON.

DECEMBER.

B. A. C. 6060	6.5	+2.29	+ 9.0	−18 46.9	1 2 42.0	+ 1 30.7	−0.0744	0.5484	+0.0127	+12	−39
B. A. C. 6287	5.7	2.34	11.1	18 47.3	19 11.8	− 6 30.9	+0.3593	0.5460	0.0388	+40	−14
B. A. C. 6294	5.2	2.33	11.2	18 28.0	19 48.5	− 5 55.4	+0.0266	0.5459	0.0398	+20	−34
ρ¹ Sagittarii	3.9	2.42	14.2	18 01.7	2 20 17.0	− 6 13.2	+0.9633	0.5413	0.0761	+72	+23
υ Sagittarii	4.7	2.39	14.5	16 08.1	20 20.6	− 6 09.8	−1.1358	0.5413	0.0763	−48	−90
c¹ Sagittarii	5.6	+2.45	+15.4	−16 30.8	3 5 41.3	+ 2 53.5	+0.0587	0.5393	+0.0892	+27	−31
c² Sagittarii	5.0	2.45	15.6	16 21.0	6 34.9	+ 3 45.4	−0.0436	0.5392	0.0905	+22	−37
B. A. C. 6746	5.5	2.45	15.6	15 41.6	7 06.1	+ 4 15.7	−0.7248	0.5391	0.0910	−16	−90
g Sagittarii	5.0	2.49	16.4	15 44.8	14 14.7	+11 11.0	+0.0192	0.5376	0.1004	+26	−34
B. A. C. 6992	6.2	2.55	17.6	15 05.4	4 1 38.7	− 1 46.0	+0.5162	0.5353	0.1145	+59	− 6
β Capricorni	3.4	+2.55	+17.6	−15 05.2	1 45.8	− 1 39.1	+0.5264	0.5352	+0.1147	+60	− 5
B. A. C. 7087	6.2	2.58	18.4	14 03.2	8 23.7	+ 4 46.6	+0.1694	0.5342	0.1223	+37	−25
B. A. C. 7221	6.3	2.62	19.2	12 54.2	16 43.8	−11 08.5	−0.0430	0.5327	0.1314	+26	−37
B. A. C. 7242	6.5	2.62	19.6	11 56.3	17 57.5	− 9 57.0	−0.9431	0.5325	0.1328	−26	−90
8 Aquarii	6.8	2.66	19.3	13 25.7	21 23.6	− 6 27.2	+1.1594	0.5322	0.1362	+77	+39
ν Aquarii	4.6	+2.69	+20.1	−11 46.3	5 2 19.0	− 1 50.7	+0.0091	0.5314	+0.1410	+30	− 34
17 Aquarii	6.4	2.71	21.0	9 43.9	9 07.6	+ 4 45.6	−1.2386	0.5307	0.1474	−50	−90
19 Aquarii	5.7	2.73	20.8	10 09.6	10 16.6	+ 5 52.5	−0.5975	0.5305	0.1485	− 2	−77
B. A. C. 7562	5.5	2.82	21.5	9 28.9	20 18.9	− 8 23.3	+0.1930	0.5299	0.1569	+43	−24
c¹ Capricorni	5.2	2.81	21.4	9 31.6	20 21.5	− 8 20.8	+0.2494	0.5299	0.1569	+46	−21
c² Capricorni	6.2	+2.82	+21.4	− 9 43.4	21 00.0	− 7 43.5	+0.5642	0.5299	+0.1574	+69	− 4
30 Aquarii	5.6	2.89	22.6	6 59.4	6 5 41.2	+ 0 42.1	−1.0187	0.5299	0.1638	−27	−90
B. A. C. 7717	6.9	2.92	22.4	8 00.1	8 50.6	+ 3 45.8	+0.6029	0.5299	0.1659	+73	− 1
44 Aquarii	5.9	2.95	23.1	5 52.2	12 44.3	+ 7 32.6	−1.0602	0.5301	0.1684	−30	−90
51 Aquarii	5.8	2.98	23.2	5 19.6	16 18.3	+11 00.2	−1.0434	0.5304	0.1705	−28	−90
κ Aquarii	5.5	+3.05	+23.4	− 4 43.6	23 13.6	− 6 17.1	−0.4947	0.5312	+0.1743	+ 7	−67

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

Name.	Mag.	Red'ns from 1902.0. Δα	Red'ns from 1902.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	Limiting Parallels. N.	Limiting Parallels. S.
		s	"	° '	d h m	h m				°	°
Lalande 44337	6.3	+3.06	+23.6	− 4 03.4	7 0 45.8	− 4 47.7	−0.9494	0.5314	+0.1750	−20	−90
B. A. C. 7951	6.7	3.10	23.3	4 43.8	4 19.7	− 1 20.3	+0.4047	0.5319	0.1767	+59	−12
Lalande 44872	7.0	3.15	23.6	3 45.7	8 59.9	+ 3 11.4	+0.1925	0.5328	0.1786	+45	−24
12 Piscium	6.8	3.33	23.8	1 34.1	8 1 10.5	− 5 07.7	+0.7764	0.5370	0.1833	+88	+ 8
13 Piscium	6.4	3.34	23.7	− 1 37.2	2 23.1	− 3 57.3	+1.0532	0.5375	0.1836	+88	+28
15 Piscium	6.6	+3.38	+24.4	+ 0 46.7	4 07.8	− 2 15.9	−1.1724	0.5380	+0.1838	−38	−89
λ Piscium	4.7	3.42	24.3	1 14.8	7 22.1	+ 0 52.4	−1.0711	0.5395	0.1842	−29	−89
21 Piscium	6.1	3.45	24.0	0 32.3	10 59.4	+ 4 22.9	+0.3467	0.5406	0.1845	+56	−16
25 Piscium	6.3	3.48	24.1	1 33.1	12 45.3	+ 6 05.4	−0.3980	0.5413	0.1846	+13	−59
60 Piscium	6.2	3.86	23.0	6 12.8	9 14 37.1	+ 7 07.2	−0.5214	0.5543	0.1803	+ 6	−67
62 Piscium	6.0	+3.87	+23.1	+ 6 46.3	15 01.7	+ 7 31.0	−1.0264	0.5546	+0.1801	−26	−83
δ Piscium	4.8	3.88	23.2	7 03.5	15 12.6	+ 7 41.5	−1.2908	0.5547	0.1801	−54	−83
B. A. C. 274	6.2	3.92	22.1	5 57.7	20 21.7	−11 19.7	+0.7671	0.5578	0.1779	+90	+ 9
ε Piscium	4.5	3.97	22.3	7 22.1	21 47.3	− 9 57.0	−0.4323	0.5588	0.1771	+11	−60
ζ Piscium	5.4	4.02	21.5	7 03.8	10 2 41.1	− 5 13.1	+0.7426	0.5619	0.1745	+90	+ 8
54 Ceti	5.5	+4.32	+19.6	+10 33.8	19 08.8	+10 40.2	−0.0606	0.5735	+0.1620	+31	−35
B. A. C. 609	6.2	4.38	19.2	11 49.5	22 50.4	− 9 46.0	−0.7469	0.5763	0.1585	− 7	−78
o Arietis	5.8	4.70	15.5	14 54.1	11 17 47.1	+ 8 28.8	−1.0348	0.5904	0.1385	−28	−75
σ Arietis	5.5	4.72	14.6	14 40.9	20 37.7	+11 12.9	−0.4344	0.5924	0.1317	+11	−54
B. A. C. 1119	6.4	4.97	9.4	16 13.2	12 15 44.2	+ 5 34.7	+0.2618	0.6058	0.0999	+51	−10
B. A. C. 1206	6.0	+5.05	+ 7.8	+17 02.3	21 03.7	+10 41.5	−0.0409	0.6091	+0.0898	+32	−26
B. A. C. 1240	5.7	5.10	6.9	17 55.2	13 0 00.0	−10 29.4	−0.6547	0.6107	0.0839	− 3	−67
B. A. C. 1272	6.3	5.09	5.9	17 04.8	2 46 7	− 7 49.4	+0.3981	0.6122	0.0783	+61	0
W.B.(2),iv,248	5.9	5.17	4.5	18 30.5	7 29.1	− 3 18.6	−0.6622	0.6146	0.0684	− 3	−67
δ¹ Tauri	4.0	5.13	4.0	17 18.8	8 27.6	− 2 22.5	+0.5779	0.6151	0.0664	+76	+11
δ² Tauri	4.7	+5.13	+ 3.9	+17 13.1	8 54.1	− 1 57.0	+0.7011	0.6153	+0.0654	+90	+18
B. A. C. 1361	6.5	5.20	4.0	18 49.1	9 12.2	− 1 39.7	−0.8507	0.6154	0.0648	−15	−71
δ³ Tauri	5.0	5.15	3.8	17 42.3	9 25.3	− 1 27.3	+0.2566	0.6155	0.0643	+51	− 7
ε Tauri	3.6	5.20	3.4	18 57.8	10 35.3	− 0 20.1	−0.9062	0.6160	0.0618	−19	−71
B. A. C. 1468	6.3	5.22	1.2	18 33.5	17 15.0	+ 6 03.0	−0.1439	0.6186	0.0469	+26	−28
i Tauri	5.2	+5.23	+ 0.5	+18 40.4	19 09.5	+ 7 52.7	−0.1711	0.6193	+0.0427	+25	−29
B. A. C. 1563	6.5	5.28	− 1.3	19 40.3	14 0 26.3	−11 03.7	−0.9542	0.6207	0.0306	−22	−70
m Tauri	5.1	5.27	1.7	18 30.8	1 08.7	−10 23.1	+0.2003	0.6208	0.0290	+47	− 7
107 Tauri	6.5	5.29	1.8	19 43.9	1 40.1	− 9 53.0	−0.9772	0.6211	0.0278	−25	−70
B. A. C. 1651	6.5	5.29	3.3	19 42.9	6 10.3	− 5 34.2	−0.8576	0.6219	0.0172	−16	−70
115 Tauri	5.4	+5.23	− 4.1	+17 52.6	8 30.7	− 3 19.7	+0.9715	0.6223	+0.0117	+90	+41
119 Tauri	4.6	5.25	4.8	18 31.2	10 22.5	− 1 32.7	+0.3609	0.6225	0.0074	+58	+ 4
120 Tauri	5.3	5.25	4.8	18 28.2	10 51.7	− 1 04.7	+0.4141	0.6226	+0.0062	+62	+ 7
B. A. C. 1796	7.5	5.25	5.0	18 56.2	14 10.5	+ 2 05.7	−0.0354	0.6227	−0.0016	+33	−17
127 Tauri	6.3	5.26	6.2	18 55.8	14 19.7	+ 2 14.6	−0.0291	0.6228	0.0020	+33	−17
130 Tauri	5.5	+5.21	− 6.7	+17 41.5	16 01.9	+ 3 52.4	+1.1744	0.6228	−0.0060	+90	+58
Lalande 11088	6.1	5.29	7.4	19 50.5	17 50.2	− 5 36.1	−0.9396	0.6227	0.0103	−22	−70
χ² Orionis	5.8	5.28	7.6	19 43.7	18 47.1	+ 6 30.7	−0.8406	0.6227	0.0125	−15	−70
χ³ Orionis	5.1	5.26	8.7	19 41.4	21 56.6	+ 9 32.2	−0.8543	0.6224	0.0200	−16	−70
68 Orionis	5.6	5.26	9.8	19 48.6	15 1 07.5	−11 24.9	−1.0466	0.6220	0.0274	−31	−70
71 Orionis	5.1	+5.23	−10.3	+19 11.2	2 11.3	−10 23.8	−0.4690	0.6219	−0.0299	+ 8	−47
Lalande 12148	7.0	5.16	10.9	17 37.2	5 10.7	− 7 32.0	+0.9617	0.6213	0.0368	+90	+38
20 Geminorum	6.3	5.15	12.0	17 50.7	8 42.3	− 4 09.3	+0.5970	0.6205	0.0450	+78	+14
21 Geminorum	6.5	5.15	12.1	17 51.0	8 42.6	− 4 09.0	+0.5919	0.6205	0.0450	+78	+14
22 Geminorum	7.2	5.21	12.3	19 30.1	9 33.7	− 3 20.0	−1.0604	0.6203	0.0469	−32	−70
26 Geminorum	5.0	+5.12	−13.3	+17 44.2	12 29.5	− 0 31.5	+0.5163	0.6194	−0.0535	+70	+ 9
W.B.(2)vi,1630	5.9	5.07	15.6	17 53.4	20 01.4	+ 6 41.6	−0.0990	0.6167	0.0701	+29	−27
51 Geminorum	5.4	4.98	16.5	16 19.2	16 0 12.0	+10 41.8	+1.1278	0.6148	0.0787	+90	+48
λ Geminorum	3.6	4.99	17.1	16 42.8	1 59.8	−11 34.8	+0.5988	0.6140	0.0827	+78	+10
W. 7ʰ, 685	5.6	4.95	18.4	17 17.5	7 14.1	− 6 33.3	−0.4304	0.6114	0.0930	+10	−50
67 Geminorum	7.5	+4.98	−18.3	+15 50.7	7 52.5	− 5 56.5	+0.9305	0.6110	−0.0945	+90	+31

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

| | | THE STAR'S | | | | AT CONJUNCTION IN R. A. | | | | | Limiting Parallels. | |
| | | Red'ns from 1902.0 | | Apparent Declination. | Washington Mean Time. | Hour Angle, H | Y | x' | y' | | |
Name.	Mag.	Δα	Δδ							N.	S.
		s	''	° '	d h m	h m				°	°
68 Geminorum	5.0	+4.99	-18.5	+16 01.9	16 7 57.0	- 5 52.2	+0.7394	0.6110	-0.0947	+90	+18
1 Cancri	5.9	4.82	20.7	16 02.8	17 02.0	+ 2 50.9	-0.2120	0.6056	0.1117	+23	-37
B. A. C. 2649	6.3	4.83	20.9	16 46.6	17 37.4	+ 3 24.9	-0.9982	0.6053	0.1127	-25	-73
5 Cancri	6.3	4.82	21.2	16 43.2	18 47.7	+ 4 32.4	-1.0754	0.6045	0.1145	-32	-73
29 Cancri	5.9	4.64	22.9	14 31.7	17 5 36.7	- 9 04.0	-0.2523	0.5974	0.1324	+21	-42
A¹ Cancri	5.6	+4.53	-23.6	+13 01.6	11 32.4	- 3 22.0	+0.4285	0.5932	-0.1407	+62	- 5
A² Cancri	5.8	4.50	23.7	12 27.8	13 04.4	- 1 53.5	+0.7705	0.5921	0.1426	+90	+15
60 Cancri	5.7	4.45	24.1	11 59.6	16 46.4	- 1 40.2	+0.7004	0.5895	0.1472	+90	+10
α Cancri	4.3	4.43	24.3	12 13.8	17 49.6	+ 2 40.9	+0.3083	0.5888	0.1484	+53	-13
κ Cancri	5.1	4.37	24.5	11 03.4	21 41.6	+ 6 24.3	+0.8954	0.5860	0.1540	+90	+21
ω Leonis	5.6	+4.24	-25.0	+ 9 28.6	18 6 26.7	- 9 10.0	+1.0924	0.5798	-0.1634	+90	+34
λ Leonis	5.4	4.23	25.3	10 08.5	7 56.2	- 7 43.8	+0.1807	0.5788	0.1648	+45	-21
o Leonis	3.8	4.17	25.8	10 19.9	11 53.5	- 3 55.1	-0.6704	0.5760	0.1684	- 3	-78
10 Sextantis	6.0	4.07	26.0	9 23.4	18 32.8	+ 2 30.0	-0.8619	0.5716	0.1736	-14	-81
11 Sextantis	6.0	4.07	25.9	8 46.5	19 17.5	+ 3 13.2	-0.3685	0.5711	0.1742	+14	-55
π Leonis	5.0	+4.05	-25.8	+ 8 30.4	20 12.7	+ 4 06.4	-0.2584	0.5705	-0.1748	+20	-48
16 Sextantis	6.9	3.99	25.4	6 38.6	19 0 13.2	+ 7 58.4	+0.9270	0.5679	0.1774	+90	+20
43 Leonis	6.5	3.91	25.8	7 02.0	6 21.7	-10 05.8	-0.5682	0.5641	0.1808	+ 3	-71
34 Sextantis	6.7	3.80	24.8	4 05.3	15 17.0	- 1 28.7	+0.8156	0.5590	0.1843	+90	+13
35 Sext.(1ˢᵗ star)	6.2	3.80	25.2	5 15.2	15 35.8	- 1 10.5	-0.4382	0.5589	0.1844	+11	-62
d Leonis	5.0	+3.70	-24.8	+ 4 08.2	23 32.7	+ 6 30.4	-0.7665	0.5547	-0.1864	- 8	-86
p³ Leonis	6.2	3.64	24.3	2 28.8	20 2 31.5	+ 9 23.3	+0.3870	0.5532	0.1868	+58	-14
75 Leonis	5.4	3.61	24.3	2 32.5	7 22.2	- 9 55.5	-0.5834	0.5511	0.1872	+ 2	-74
76 Leonis	6.3	3.60	24.1	2 10.9	8 08.5	- 9 10.7	-0.3532	0.5507	0.1873	+15	-56
79 Leonis	5.5	3.57	23.9	+ 1 56.3	10 33.5	- 6 50.5	-0.5552	0.5497	0.1873	+ 4	-72
υ Leonis	4.4	+3.52	-22.7	- 0 17.3	16 41.4	- 0 54.5	+0.6168	0.5474	-0.1870	+78	- 1
B. A. C. 4134	6.0	3.34	20.2	3 24.9	21 12 33.2	- 5 40.6	+0.2281	0.5414	0.1823	+48	-22
B. A. C. 4200	5.7	3.30	19.8	4 04.7	17 17.3	- 1 55.0	+0.0714	0.5404	0.1803	+38	-31
B. A. C. 4225	6.3	3.28	19.5	4 31.1	19 08.0	+ 0 41.7	+0.2052	0.5401	0.1795	+46	-23
f Virginis	5.9	3.27	18.8	5 17.8	21 39.0	+ 1 08.1	+0.5830	0.5396	0.1779	+73	- 3
B. A. C. 4294	6.1	+3.23	-18.0	- 5 46.2	22 2 55.7	+ 8 15.0	+0.1531	0.5388	-0.1755	+42	-26
B. A. C. 4394	5.9	3.17	16.0	8 27.8	13 15.0	- 5 45.0	+1.2545	0.5379	0.1691	+82	+49
h Virginis	5.5	3.08	14.2	9 39.8	23 1 18.0	+ 5 55.5	+0.5652	0.5375	0.1601	+69	- 4
B. A. C. 4591	6.3	3.02	13.3	9 13.3	8 20.8	-11 14.7	-1.0197	0.5376	0.1540	-27	-90
λ Virginis	4.7	2.97	9.8	12 55.4	24 0 03.0	+ 3 58.3	+0.6913	0.5386	0.1388	+76	+ 4
5 Libræ	6.6	+2.92	- 7.2	-15 02.9	13 13.7	- 7 15.5	+1.2815	0.5401	-0.1241	+75	+58
μ Libræ	5.4	2.87	7.3	13 44.6	14 53.5	- 5 38.9	-0.3515	0.5403	0.1221	+ 9	-57
ν¹ Libræ	5.4	2.87	5.4	15 52.7	23 19.9	+ 2 31.7	+1.0024	0.5414	0.1117	+74	+25
ν² Libræ	6.9	2.87	5.3	16 06.4	23 25.4	+ 2 36.9	+1.2422	0.5414	0.1116	+74	+51
o¹ Libræ	6.0	2.81	4.4	15 11.8	25 6 21.7	+ 9 20.2	-0.5006	0.5426	0.1026	- 2	-68
o² Libræ	7.0	+2.79	- 4.3	-14 47.1	7 20.8	+10 17.5	-1.0527	0.5426	-0.1014	-39	-90
ζ¹ Libræ	5.7	2.81	3.6	16 22.6	9 51.9	-11 16.2	+0.4457	0.5429	0.0980	+52	-10
ζ² Libræ	7.0	2.82	3.3	17 06.2	10 30.0	-10 39.3	+1.1850	0.5430	0.0971	+73	+44
ζ³ Libræ	6.0	2.81	3.5	16 06.5	11 02.5	-10 07.8	+0.2198	0.5431	0.0964	+38	-22
ζ⁴ Libræ	5.8	2.80	3.2	16 31.3	12 07.9	- 9 04.4	+0.3878	0.5432	0.0949	+48	-13
θ Libræ	4.3	+2.75	- 1.4	-16 26.5	22 15.7	+ 0 44.2	-0.5900	0.5447	-0.0807	-10	-77
49 Libræ	5.6	2.68	- 0.9	16 14.7	26 1 27.0	+ 3 49.3	-1.0584	0.5451	0.0761	-41	-90
χ Ophiuchi	5.0	2.70	+ 1.6	18 14.0	14 15.1	- 7 47.0	+0.2879	0.5466	0.0570	+37	-18
24 Scorpii	5.5	2.64	2.6	17 33.1	21 15.8	- 0 59.7	-0.8295	0.5473	-0.0462	-27	-90
					NEW	*MOON.*					
B. A. C. 6992	6.2	+2.45	+16.8	-15 05.4	31 7 37.6	+ 6 00.4	+0.3411	0.5377	+0.1132	+48	-16
β Capricorni	3.4	2.46	16.8	15 05.2	7 44.7	+ 6 07.3	+0.3511	0.5377	0.1133	+48	-15
B. A. C. 7087	6.2	+2.45	+17.5	-14 03.2	14 21.1	-11 28.5	-0.0192	0.5364	+0.1211	+26	-36

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1902.

Date.	The Star's Name.	Mag.	IMMERSION. Washington, Sidereal Time.	IMMERSION. Washington, Mean Time.	IMMERSION. Angle from North Point.	IMMERSION. Angle from Vertex.	EMERSION. Washington, Sidereal Time.	EMERSION. Washington, Mean Time.	EMERSION. Angle from North Point.	EMERSION. Angle from Vertex.	Duration of Occultation.
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 1	56 Virginis	7.0	10 57.9	16 13.5	67	97	11 52.2	17 07.7	349	9	0 54.2
11	ν Aquarii *	4.6	- 2 28.0	7 05.7	44	354	3 20.1	7 57.7	274	223	0 52.0
14	λ Piscium	4.7	3 49.5	8 15.2	29	340	4 40.0	9 05.6	286	226	0 50.4
19	W.B.(2),iv,248	5.9	2 10.7	6 17.1	118	164	3 10 9	7 17.1	219	250	1 00.0
19	B. A. C. 1361	6.5	4 42.6	8 48.6	91	78	6 02.7	10 08.4	258	216	1 19.8
19	ε Tauri	3.6	6 48.6	10 54.2	74	24	7 57.8	12 03.2	285	230	1 09.0
20	B. A. C. 1796	7.5	12 14.0	16 14.7	148	94	12 45.5	16 46.1	226	171	0 31.4
20	127 Tauri ‡	6.3	12 22.4	16 23.1	146	91	12 54.9	16 55.5	228	173	0 32.4
23	A² Cancri	5.8	14 34.9	18 23.5	67	15	15 13.8	19 02.3	330	278	0 38.8
31	28 Libræ	6.0	12 19.5	15 37.0	162	198	13 08.8	16 26.2	237	264	0 49.2
Feb. 1	ν Scorpii	4.2	12 58.7	16 12.1	49	86	13 45.2	16 58.5	341	9	0 46.4
15	B. A. C. 1240	5.7	2 03.6	4 23.8	74	118	3 23.8	5 43.8	259	276	1 20.0
18	W.B.(2),vi,1630	5.9	2 37.2	4 45.5	68	123	3 39.2	5 47.3	298	351	1 01.8
18	λ Geminorum	3.6	11 56.7	14 03.5	176	122	12 16.8	14 23.5	215	162	0 20.0
20	60 Cancri	5.7	2 40.4	4 40.8	122	184	3 34.3	5 34.6	261	314	0 53.8
20	κ Cancri	5.1	9 31.6	11 30 9	133	121	10 47.8	12 46.9	277	238	1 16.0
24	28 Virginis	7.0	17 02.9	18 45.2	80	29	17 55.6	19 37.8	326	274	0 52.6
25	a Virginis	1.2	13 47.0	15 26.0	150	143	14 59.6	16 38.4	260	236	1 12.4
Mar. 1	B. A. C. 5580	5.7	13 00.6	14 23.9	88	128	14 19.2	15 42.3	297	325	1 18.4
4	ρ' Sagittarii	3.9	17 25.9	18 36.7	46	69	18 40.4	19 51.3	293	302	1 14.6
13	σ Arietis	5.5	6 57.1	7 34.3	118	65	7 47.3	8 24.3	224	171	0 50.0
15	ι Tauri	5.2	6 54.7	7 24.0	120	73	8 00.1	8 29.2	243	189	1 05.2
19	A¹ Cancri	5.6	6 02.3	6 16.1	59	145	6 55.9	7 09.5	336	12	0 53.4
19	A² Cancri	5.8	8 30.1	8 43.5	115	120	9 53.4	10 06.5	290	318	1 23.0
21	36 Sextantis *	6.6	17 19.8	17 23.8	111	60	18 11.5	18 15.4	285	236	0 51.6
Apr. 13	26 Geminorum	5.0	11 54.3	10 28.8	105	51	12 49.7	11 24.0	279	226	0 55.2
14	68 Geminorum	5.0	8 30.9	7 02.0	167	139	9 11.6	7 42.6	227	187	0 40.6
16	ω Leonis	5.6	11 38.2	10 01.0	81	42	12 39.2	11 01.8	329	282	1 00.8
18	ρ⁵ Leonis	5.5	15 15.9	13 30.2	119	71	16 21.1	14 35.2	286	235	1 05.0
20	28 Virginis	7.0	9 45.1	7 52.4	164	203	10 37.8	8 45.0	250	281	0 52.6
23	ν² Libræ *	6.9	9 28.4	7 24.0	41	92	9 53.5	7 49.0	354	44	0 25.0
24	ν Scorpii	4.2	19 52.8	17 42.9	150	118	20 29.7	18 19.5	210	165	0 36.6
29	B. A. C. 6992	6.2	17 46.3	15 16.9	52	81	19 07.7	16 38.1	277	296	1 21.2
29	β Capricorni	3.4	17 55.2	15 25.8	55	85	19 18.9	16 49.2	273	286	1 23.4
May 9	m Tauri	5.1	9 03.3	5 56.0	158	103	9 30 9	6 23.6	210	155	0 27.6
11	λ Geminorum	3.6	11 30.0	8 14.4	99	44	12 29.1	9 13.4	292	238	0 59.0
13	κ Cancri	5.1	9 03.5	5 40.5	98	97	10 22.3	6 59.1	311	282	1 18.6
14	14 Sextantis	6.6	13 55.5	10 27.8	152	103	14 47.7	11 19.8	255	204	0 52.0
18	28 Virginis *	7.0	19 26.5	15 42.1	91	41	20 18.6	16 34.1	298	251	0 52.0
19	a Virginis	1.2	17 36.0	13 48 0	152	107	18 23.5	14 35.4	237	189	0 47.4
20	a¹ Libræ	6.3	9 28.7	5 38.1	116	166	10 33.9	6 43.1	283	328	1 05.0
20	a² Libræ †	2.9	9 36.8	5 46.2	122	171	10 41.4	6 50.6	277	321	1 04.4
22	B. A. C. 5580	5.7	17 17.1	13 17.1	97	88	18 48.3	14 48.3	267	239	1 31.2
28	c¹ Capricorni	5.2	20 19.1	15 55.3	59	79	21 47.2	17 23.1	249	247	1 27.8
28	B. A. C. 7562	5.5	20 20.9	15 57.1	48	67	21 45.6	17 21.5	261	262	1 24.4
June 11	36 Sextantis *	6.6	16 57.9	11 39.6	133	81	17 47.0	12 28.6	265	214	0 49.0
16	a¹ Libræ ‡	6.3	20 01.1	14 22.6	59	10	20 50.8	15 12.2	314	262	0 49.6
16	a² Libræ ‡	2.9	20 04.7	14 26.2	70	20	21 00.0	15 21.4	303	252	0 55.2
25	B. A. C. 7717 *	6.9	15 10.9	8 57.8	105	154	16 00.6	9 47.4	226	277	0 49.6
July 1	B. A. C. 1119	6.4	21 26.6	14 49.9	126	179	22 00.7	15 23.9	205	259	0 34.0

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington.   † Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1902.

Date.	The Star's Name.	Mag.	IMMERSION. Washington, Sidereal Time.	Washington, Mean Time.	Angle from North Point.	Angle from Vertex.	EMERSION. Washington, Sidereal Time.	Washington, Mean Time.	Angle from North Point.	Angle from Vertex.	Duration of Occultation.
			h m	h m	°	°	h m	h m	°	°	h m
July 7	ω Leonis ‡	5.6	16 21.3	9 20.9	99	47	17 09.3	10 08.7	295	244	0 47.8
23	B. A. C. 7951	6.7	17 44.7	9 41.1	28	77	18 33.2	10 29.5	292	338	0 48.4
23	Lalande 44872	7.0	23 59.2	15 54.6	54	35	1 19.8	17 15.0	249	214	1 20.4
Aug. 10	ν² Libræ *	6.9	21 00.4	11 45.5	103	51	21 58.0	12 42.9	267	218	0 57.4
10	ν¹ Libræ *	5.4	21 02.3	11 47.4	46	354	21 40.0	12 25.0	325	275	0 37.6
18	c² Capricorni	6.2	20 21.8	10 35.6	35	54	21 36.6	11 50.2	276	275	1 14.6
26	m Tauri	5.1	2 37.6	16 18.9	75	125	3 55.4	17 36.5	270	301	1 17.6
Sept. 6	5 Libræ *	6.6	21 11.9	10 10.8	173	123	21 25.5	10 24.4	201	151	0 13.6
7	ζ² Libræ	7.0	17 12.3	6 07.9	122	98	18 31.1	7 26.5	255	219	1 18.6
15	B. A. C. 7717	6.9	16 34.1	4 58.4	46	97	17 30.3	5 54.4	281	329	0 56.0
24	26 Geminorum	5.0	23 36.7	11 24.4	56	111	0 20.4	12 08.0	302	356	0 43.6
26	A³ Cancri	5.8	3 53.5	15 32.6	144	197	4 41.2	16 20.2	239	291	0 47.6
Oct. 9	ρ¹ Sagittarii	3.9	18 21.3	5 10.9	155	168	18 52.9	5 42.5	182	189	0 31.6
10	B. A. C. 6992	6.2	0 50.3	11 34.9	120	73	1 32.0	12 16.5	202	152	0 41.6
10	β Capricorni ‡	3.4	1 00.2	11 44.8	126	78	1 36.3	12 20.8	197	146	0 36.0
11	ν Aquarii	4.6	1 17.3	11 57.9	0	315	1 42.9	12 23.5	316	268	0 25.6
13	B. A. C. 7951	6.7	0 07.8	10 40.7	79	57	1 23.2	11 55.9	227	191	1 15.2
14	12 Piscium	6.8	18 05.6	4 35.6	88	139	19 05.5	5 35.4	230	278	0 59.8
14	21 Piscium *	6.1	6 18.8	16 46.8	111	61	6 59.3	17 27.2	214	165	0 40.4
16	ζ Piscium †	5.4	17 50.4	4 12.6	75	126	18 40.9	5 03.0	249	301	0 50.4
19	δ¹ Tauri	4.0	23 59.1	10 08.5	82	136	1 04.2	11 13.5	252	304	1 05.0
19	δ² Tauri	5.7	0 35.7	10 45.0	118	172	1 27.6	11 36.8	216	267	0 51.8
19	δ³ Tauri	5.0	1 34.7	11 43.9	24	74	2 17.6	12 26.7	311	356	0 42.8
20	119 Tauri	4.6	3 50.7	13 55.5	69	110	5 07.5	15 12.1	285	295	1 16.6
20	120 Tauri	5.3	4 33.4	14 38.1	84	111	5 55.2	15 59.7	274	258	1 21.6
21	Lalande 12148	7.0	23 20.2	9 21.9	153	207	23 41.9	9 43.5	203	257	0 21.6
21	21 Geminorum	6.5	3 09.0	13 10.0	107	160	4 20.0	14 20.8	255	301	1 10.8
21	20 Geminorum	6.3	3 09.5	13 10.5	108	161	4 22.1	14 22.9	253	300	1 12.4
22	68 Geminorum	5.0	4 13.3	14 10.2	139	191	5 07.9	15 04.6	235	281	0 54.4
Nov. 15	B. A. C. 1272	6.3	7 42.5	16 04.0	89	36	8 45.4	17 07.2	265	211	1 03.2
16	m Tauri	5.1	5 32.9	13 51.3	50	33	6 33.8	14 52.1	308	268	1 00.8
18	λ Geminorum	3.6	7 46.9	15 57.1	117	100	9 03.1	17 13.1	270	228	1 16.0
21	16 Sextantis	6.9	8 36.5	16 34.8	180	208	9 10.4	17 08.6	229	247	0 32.8
24	f Virginis †	5.9	6 20.1	14 06.9	108	159	7 19.1	15 05.7	293	343	0 58.8
25	h Virginis	5.5	10 40.1	18 22.3	64	100	11 30.0	19 11.9	348	16	0 49.6
26	λ Virginis	4.7	8 58.4	16 36.9	120	170	10 02.2	17 40.5	282	327	1 03.6
Dec. 4	B. A. C. 7087 *	6.2	2 36.4	9 44.5	12	321	3 05.1	10 13.1	313	262	0 28.6
6	B. A. C. 7717	6.9	2 45.6	9 45.8	111	63	3 31.3	10 31.4	205	155	0 45.6
7	Lalande 44872	7.0	3 08.6	10 04.8	28	340	3 59.3	10 55.4	289	239	0 50.6
8	21 Piscium ‡	6.1	5 05.2	11 57.1	69	18	6 03.7	12 55.5	253	202	0 58.4
12	B. A. C. 1119	6.4	10 17.9	16 53.3	14	320	10 33.5	17 08.9	338	284	0 15.6
13	δ¹ Tauri	4.0	0 22.1	6 55.2	90	144	1 26.5	7 59.4	243	294	1 04.2
13	δ² Tauri	5.7	1 02.7	7 35.7	129	182	1 45.5	8 18.3	205	253	0 42.6
13	δ³ Tauri	5.0	1 49.8	8 22.6	37	86	2 45.1	9 17.8	298	336	0 55.2
15	21 Geminorum	6.5	0 36.4	7 01.5	108	161	1 29.1	7 54.1	249	303	0 52.6
15	20 Geminorum	6.3	0 38.8	7 03.9	120	174	1 30.3	7 55.3	260	315	0 51.4
15	26 Geminorum	5.0	5 21.3	11 45.7	133	166	6 23.3	12 47.5	238	245	1 01.8
16	68 Geminorum †	5.0	0 06.2	6 27.5	139	193	0 40.7	7 01.9	228	282	0 34.4
17	A¹ Cancri	5.6	2 32.8	9 49.6	112	165	4 33.8	10 50.4	269	321	1 00.8
20	ν Leonis	4.4	9 33.1	15 37.1	134	165	10 51.3	16 55.1	281	294	1 18.0

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
 * Whole occultation below the horizon of Washington.   † Immersion below the horizon of Washington.
 ‡ Emersion below the horizon of Washington.

FOR WASHINGTON MEAN NOON.

Date.	k	i	θ	L	Date.	k	i	θ	L
		°	°	·			°	°	
Jan.　0	0.999	4.1	113.8	25.5	July　4	0.108	141.6	161.8	15.7
5	0.997	6.4	35.6	27.6	9	0.207	125.8	167.6	26.8
10	0.986	13.5	11.0	31.2	14	0.332	109.6	172.6	38.1
15	0.963	22.1	359.9	37.1	19	0.481	92.1	177.7	49.8
20	0.916	33.6	352.2	45.5	24	0.649	72.7	183.7	60.9
25	0.832	48.2	346.0	56.7	29	0.810	51.5	190.8	68.1
30	0.686	68.2	341.1	66.4	Aug.　3	0.933	30.0	200.6	67.3
Feb.　4	0.471	93.2	336.3	65.3	8	0.991	11.2	223.9	59.3
9	0.237	121.7	330.9	44.1	13	0.994	8.3	341.0	49.3
14	0.067	156.6	317.3	14.7	18	0.970	20.0	8.5	41.0
19	0.010	168.5	225.6	2.2	23	0.931	30.5	16.0	35.0
24	0.080	146.9	176.3	14.7	28	0.891	38.4	20.4	31.3
Mar.　1	0.205	126.1	167.9	28.3	Sept.　2	0.849	45.7	23.0	29.2
6	0.331	109.8	164.0	34.1	7	0.804	52.5	24.6	28.4
11	0.440	96.9	161.1	34.8	12	0.756	59.3	25.7	28.7
16	0.526	87.0	158.3	33.3	17	0.700	66.5	26.3	30.1
21	0.598	78.8	155.8	31.9	22	0.632	74.7	26.8	32.4
26	0.664	70.9	153.6	31.3	27	0.547	84.6	27.2	35.3
31	0.721	63.7	151.8	31.4	Oct.　2	0.442	96.7	27.8	38.0
Apr.　5	0.778	56.3	150.3	32.7	7	0.305	113.0	29.4	36.6
10	0.833	48.1	149.2	35.5	12	0.176	130.3	32.0	29.9
15	0.885	38.5	148.5	40.1	17	0.017	164.9	43.5	3.8
20	0.947	26.7	148.3	47.1	22	0.030	159.9	199.3	1.1
25	0.989	11.8	147.1	56.1	27	0.209	125.6	206.9	40.2
30	0.996	6.7	342.0	64.9	Nov.　1	0.452	95.5	208.1	61.5
May　5	0.946	27.1	338.9	68.7	6	0.657	71.7	208.0	60.5
10	0.835	47.9	340.9	64.9	11	0.797	53.5	206.8	50.5
15	0.699	66.6	345.4	56.5	16	0.887	39.2	204.7	41.2
20	0.562	82.9	349.4	47.6	21	0.940	28.6	201.7	34.1
25	0.442	96.7	353.2	40.3	26	0.970	20.1	197.4	29.3
30	0.328	110.1	356.7	33.2	Dec.　1	0.988	12.6	190.8	26.4
June　4	0.228	122.9	0.1	26.3	6	0.996	6.9	177.0	24.8
9	0.139	136.1	4.0	18.5	11	1.000	2.6	115.5	24.3
14	0.066	150.2	10.4	9.9	16	0.997	6.1	35.3	25.0
19	0.018	164.5	28.4	3.0	21	0.999	12.2	18.3	26.9
24	0.007	170.3	107.7	1.2	26	0.972	19.3	9.0	30.2
29	0.035	158.4	150.9	4.5	31	0.942	28.1	2.2	35.4
July　4	0.108	141.6	161.8	15.7					

NOTATION.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i=the angle between the Sun and Earth, as seen from the planet.

$θ$=the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L=the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR WASHINGTON MEAN NOON.

Date.	k	i	θ	L	Date.	k	i	θ	L
Jan. 0	0.339	108.7	341.1	210.7	May 25	0.633	74.7	155.8	102.2
5	0.302	113.4	339.7	218.2	30	0.653	72.3	156.4	97.1
10	0.260	118.6	338.1	219.7	June 4	0.673	69.9	157.2	92.5
15	0.216	124.4	336.3	214.4	9	0.692	67.5	158.3	88.3
20	0.170	131.1	334.0	199.1	14	0.710	65.3	159.6	84.6
22	0.151	134.0	332.9	190.6	19	0.727	63.2	161.2	81.3
24	0.132	137.0	331.5	177.4	24	0.744	61.0	163.0	78.2
26	0.114	140.2	329.9	161.5	29	0.760	58.8	165.1	75.3
28	0.097	143.5	328.2	144.5	July 4	0.775	56.7	167.3	72.7
30	0.080	146.9	325.9	126.0	9	0.790	54.6	169.6	70.4
Feb. 1	0.063	150.4	323.1	106.2	14	0.804	52.5	172.1	68.3
3	0.048	153.9	319.4	86.6	19	0.818	50.4	174.9	66.4
5	0.036	157.5	314.5	67.0	24	0.832	48.3	177.7	64.6
7	0.026	161.0	307.8	49.5	29	0.845	46.3	180.6	63.0
9	0.019	164.1	298.1	35.5	Aug. 3	0.858	44.2	183.5	61.5
11	0.014	166.7	284.0	25.3	8	0.870	42.2	186.4	60.2
13	0.011	168.2	264.8	20.0	13	0.881	40.1	189.3	59.0
15	0.011	168.2	242.8	20.0	18	0.892	38.1	192.1	57.8
17	0.014	166.8	223.3	24.7	23	0.903	36.1	194.7	56.7
19	0.019	164.1	209.6	35.1	28	0.913	34.1	197.2	55.8
21	0.027	160.9	199.9	49.1	Sept. 2	0.923	32.1	199.5	54.9
23	0.037	157.5	193.1	65.5	7	0.932	30.2	201.7	54.0
25	0.049	154.0	188.3	83.6	12	0.940	28.2	203.6	53.3
27	0.063	150.5	184.5	102.1	17	0.948	26.3	205.3	52.6
Mar. 1	0.080	147.0	181.6	120.7	22	0.955	24.3	206.7	51.9
3	0.097	143.6	179.2	138.0	27	0.962	22.4	207.9	51.3
5	0.114	140.3	177.2	153.9	Oct. 2	0.968	20.5	208.9	50.7
7	0.132	137.2	175.5	166.9	7	0.974	18.6	209.7	50.2
9	0.150	134.3	174.0	177.5	12	0.979	16.8	210.3	49.8
11	0.168	131.5	172.7	186.0	17	0.983	15.0	210.6	49.4
16	0.213	125.0	169.8	199.5	22	0.987	13.1	210.6	49.0
21	0.256	119.1	167.5	203.5	27	0.991	11.3	210.3	48.7
26	0.297	113.9	165.4	200.8	Nov. 1	0.993	9.5	209.9	48.4
31	0.335	109.2	163.5	193.4	6	0.995	7.7	209.3	48.1
Apr. 5	0.371	104.9	161.8	184.4	11	0.997	5.9	208.6	47.9
10	0.404	101.0	160.3	174.2	16	0.999	4.2	208.7	47.7
15	0.435	97.4	158.9	164.2	21	0.999	2.5	211.8	47.5
20	0.465	94.0	157.8	154.3	26	1.000	0.9	222.9	47.4
25	0.492	90.8	156.9	144.8	Dec. 1	1.000	0.8	352.5	47.4
30	0.518	87.9	156.1	135.9	6	1.000	2.5	7.9	47.3
May 5	0.543	85.1	155.6	127.8	11	0.999	4.1	8.1	47.3
10	0.567	82.3	155.3	120.5	16	0.997	5.8	6.9	47.4
15	0.590	79.6	155.3	113.8	21	0.995	7.4	4.7	47.5
20	0.612	77.1	155.4	107.7	26	0.993	9.1	2.2	47.7
25	0.633	74.7	155.8	102.2	31	0.991	10.7	0.0	47.9

NOTATION.
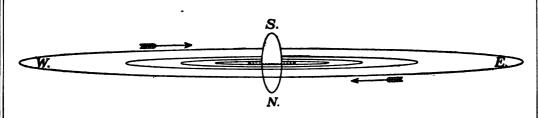
$k =$ the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

$i =$ the angle between the Sun and Earth, as seen from the planet.

$\theta =$ the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

$L =$ the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

Mars not being in opposition during the year 1902, the satellites will not be visible.

APPARENT DISK OF MARS, 190:

January	1,	0.986
January	31,	0.994
March	2,	0.999
April	1,	0.999
May	1,	0.998
May	31,	0.993
June	30,	0.984
July	30,	0.972
August	29,	0.958
September	28,	0.941
October	28,	0.924
November	27,	0.909
December	27,	0.905

The numbers in this table are the versed sines of the illuminated disk, the apparent diameter of the planet being taken as unity.

APPARENT ORBITS OF THE SATELLITES OF JUPITER IN 1902,

AS SEEN IN AN INVERTING TELESCOPE.

(The vertical scale is, for the planet three times, and for the orbits ten times, the horizontal one.)

IN the above diagram the central vertical ellipse represents the disk of Jupiter, elongated three times in the vertical direction, and the dotted ellipse represents the orbit of Satellite V. The object of the figure is to facilitate the identification of satellites in cases where the diagrams of configurations do not suffice. For example, if two satellites are seen together a reference to the above figure will show which is the inner and which the outer one of the pair.

The ephemeris of the four outer satellites of Jupiter is given on pages 482–503, each month occupying two pages, which contain respectively the times of the phenomena and the diagrams of the configurations. The latter are given for each day, Jupiter being represented by a light disk, $\bigcirc$, in the center of the page, and the relative positions of the satellites at the Washington time stated above the diagrams being indicated by dots. The designation of each satellite is shown by a numeral placed to the right or left of the dot according as the motion of the satellite at the instant in question is toward the east or toward the west—the motion being always toward the numeral. In constructing the diagrams the latitudes of the satellites are always considered zero, except where two or more of them chance to be at nearly the same distance from the planet, when they are placed one above the other according to their apparent latitudes. If at the epoch of any configuration, one or more satellites are projected on the disk of the planet, that phenomenon is indicated by a light disk, $\bigcirc$, at the left-hand side of the page; and if any satellites are invisible on account of being occulted behind the disk of the planet, or eclipsed by its shadow, that circumstance is indicated by a dark disk, $\bullet$, at the right-hand side of the page. In both cases, the annexed numerals serve to point out which satellites are thus rendered invisible.

When an observation is made at a different hour from that for which the diagram is constructed, the place of the satellite may be found by transferring its given position to the above diagram, and estimating its motion during the elapsed interval by means of the following table of—

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s		d			d	h	m	s		d
I.	1	18	28	35.945	=	1.769 860 48	III.	7	03	59	35.854	=	7.166 387 20
II.	3	13	17	53.735	=	3.554 094 16	IV.	16	18	05	06.928	=	16.753 552 41

	d	h	m	s		d
V.	0	11	57	27.635	=	0.498 236 52

SATELLITE V.

WASHINGTON MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

	d	h			d	h				d	h				d	h	
May	16	15.5	E.	Aug.	14	07.4	E.	May	16	09.5	W.	Aug.	14	13.3	W.
	26	14.6	E.		24	06.4	E.		26	08.7	W.		24	12.4	W.
June	5	13.7	E.	Sept.	3	17.5	E	June	5	07.8	W.	Sept.	3	11.5	W.
	15	12.8	E.		13	16.6	E.		15	06.9	W.		13	10.6	W.
	25	11.9	E.		23	15.7	E.		25	17.9	W.		23	09.8	W.
July	5	11.0	E.	Oct.	3	14.9	E.	July	5	17.0	W.	Oct.	3	08.9	W.
	15	10.1	E.		13	14.0	E.		15	16.1	W.		13	08.0	W.
	25	09.2	E.		23	13.2	E.		25	15.2	W.		23	07.2	W.
Aug.	4	08.3	E.	Nov.	2	12.4	E.	Aug.	4	14.2	W.	Nov.	2	06.4	W.

WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

		h	m			h	m			h	m			h	m
Feb.	12	17	06.0	May	5	3	48.1	July	25	12	36.6	Oct.	14	21	06.7
	14	11	36.3		6	22	16.6		27	7	02.6		16	15	35.0
	16	6	06.6		8	16	45.1		29	1	28.6		18	10	03.2
	18	0	36.9		10	11	13.6		30	19	54.6		20	4	31.6
	19	19	07.2		12	5	41.8	Aug.	1	14	20.6		21	23	00.1
	21	13	37.4		14	0	10.3		3	8	46.5		23	17	28.6
	23	8	07.5		15	18	38.4		5	3	12.4		25	11	57.2
	25	2	37.8		17	13	06.7		6	21	38.3		27	6	25.8
	26	21	07.9		19	7	34.7		8	16	04.2		29	0	54.6
	28	15	38.0		21	2	02.9		10	10	30.2		30	19	23.3
March	2	10	08.2		22	20	30.7		12	4	56.2	Nov.	1	13	52.2
	4	4	38.3		24	14	58.8		13	23	22.2		3	8	21.2
	5	23	08.3		26	9	26.5		15	17	48.2		5	2	50.1
	7	17	38.4		28	3	54.4		17	12	14.2		6	21	19.2
	9	12	08.3		29	22	22.0		19	6	40.4		8	15	48.2
	11	6	38.4		31	16	49.7		21	1	06.6		10	10	17.2
	13	1	08.4	June	2	11	17.2		22	19	32.8		12	4	46.5
	14	19	38.3		4	5	44.9		24	13	59.0		13	23	15.8
	16	14	07.9		6	0	12.2		26	8	25.3		15	17	45.1
	18	8	37.8		7	18	39.5		28	2	51.6		17	12	14.4
	20	3	07 6		9	13	06.8		29	21	18.1		19	6	43.9
	21	21	37.5		11	7	34.2		31	15	44.5		21	1	13.3
	23	16	07.2		13	2	01.3	Sept.	2	10	11.0		22	19	42.9
	25	10	37.0		14	20	28.5		4	4	37.6		24	14	12.4
	27	5	06.5		16	14	55.3		5	23	04.1		26	8	42.2
	28	23	36.3		18	9	22.3		7	17	30.8		28	3	11.6
	30	18	05.8		20	3	49.2		9	11	57.5		29	21	41.3
April	1	12	35.5		21	22	16.0		11	6	24.3	Dec.	1	16	11.0
	3	7	05.0		23	16	42.9		13	0	51.1		3	10	40.9
	5	1	34.5		25	11	09.8		14	19	17.9		5	5	10.7
	6	20	03.7		27	5	36.4		16	13	45.0		6	23	40.6
	8	14	33.2		29	0	03.0		18	8	12.0		8	18	10.6
	10	9	02.6		30	18	29.5		20	2	39.2		10	12	40.5
	12	3	32.0	July	2	12	56.0		21	21	06.4		12	7	10.4
	13	22	01.1		4	7	22.4		23	15	33 6		14	1	40.4
	15	16	30.3		6	1	48.9		25	10	01.0		15	20	10.5
	17	10	59.4		7	20	15.1		27	4	28.5		17	14	40 6
	19	5	28 7		9	14	41.6		28	22	56.0		19	9	10.6
	20	23	57.8		11	9	07.8		30	17	23 6		21	3	40 7
	22	18	26 9		13	3	34.0	Oct.	2	11	51.1		22	22	10.8
	24	12	55 7		14	22	00.1		4	6	18 8		24	16	41.0
	26	7	24.6		16	16	26.2		6	0	46.7		26	11	11.1
	28	1	53.3		18	10	52.3		7	19	14.5		28	5	41.4
	29	20	22.2		20	5	18.4		9	13	42.4		30	0	11.6
May	1	14	51.0		21	23	44.4		11	8	10.4		31	18	41.8
	3	9	19.7		23	18	10.5		13	2	38.6				

WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

			h m			h m			h m			h m		h m
Feb.	11		10 14.2	May	4	5 33.9	July	24	21 00.6	Oct.	14		11 49.1
	14		23 39.1		7	18 51.0		28	10 07.5		18		1 05.5
	18		13 03.8		11	8 07.6		31	23 14.3		21		14 22.6
	22		2 28.3		14	21 23.7	Aug.	4	12 21.1		25		3 40.2
	25		15 52.5		18	10 39.2		8	1 27.9		28		16 58.4
March	1		5 16.5		21	23 54.4		11	-14 34.8	Nov.	1		6 17.1
	4		18 40.3		25	13 09.0		15	3 41.9		4		19 36.4
	8		8 03.8		29	2 23.0		18	16 49.3		8		8 56.2
	11		21 27.0	June	1	15 36.5		22	5 56.8		11		22 16.6
	15		10 49.8		5	4 49.4		25	19 04.6		15		11 37.5
	19		0 12.6		8	18 01.8		29	8 12.9		19		0 58.9
	22		13 34.9		12	7 13.7	Sept.	1	21 21.6		22		14 20.6
	26		2 57.0		15	20 25.1		5	10 30.7		26		3 42.9
	29		16 18.6		19	9 35.9		8	23 40.3		29		17 05.7
April	2		5 39.9		22	22 46.2		12	12 50.5	Dec.	3		6 28.8
	5		19 00.8		26	11 56.0		16	2 01.3		6		19 52.3
	9		8 21.5		30	1 05.4		19	15 12.6		10		9 16.1
	12		21 41.7	July	3	14 14.4		23	4 24.5		13		22 40.3
	16		11 01.5		7	3 22.9		26	17 36.9		17		12 04.7
	20		0 20.9		10	16 31.0		30	6 50.0		21		1 29.4
	23		13 39.9		14	5 38.9	Oct.	3	20 03.8		24		14 54.5
	27		2 58.3		17	18 46.4		7	9 18.2		28		4 19.7
	30		16 16.4		21	7 53.6		10	22 33.3		31		17 45.1

SATELLITE III.

			h m			h m			h m			h m		h m
Feb.	14		4 08.9	May	11	7 23.4	July	28	22 39.4	Oct.	15		12 51.9
	21		8 37.5		18	11 19.0	Aug.	5	1 55.5		22		16 45.5
	28		13 04.2		25	15 10.1		12	5 11.6		29		20 44.1
March	7		17 29.3	June	1	18 57.2		19	8 28.5	Nov.	6		0 46.5
	14		21 52.3		8	22 39.2		26	11 47.8		13		4 52.9
	22		2 13.3		16	2 16.4	Sept.	2	15 10.0		20		9 02.8
	29		6 32.5		23	5 48.9		9	18 36.2		27		13 16.3
April	5		10 49.3		30	9 17.2		16	22 06.0	Dec.	4		17 33.4
	12		15 03.5	July	7	12 42.0		24	1 40.2		11		21 53.1
	19		19 14.0		14	16 03.3	Oct.	1	5 19.1		19		2 15.9
	26		23 21.1		21	19 22.6		8	9 02.8		26		6 40.1
May	4		3 24.3										

SATELLITE IV.

			h m			h m			h m			h m		h m
Feb.	9		14 03.8	May	4	16 57.2	July	27	1 03.2	Oct.	18		5 33.0
	26		10 43.2		21	10 45.9	Aug.	12	15 14.5	Nov.	3		23 27.7
March	15		7 03.5	June	7	3 39.0		29	5 38.8		20		18 15.4
April	1		2 57.9		23	19 34.7	Sept.	14	20 40.6	Dec.	7		13 46.0
	17		22 18.4	July	10	10 38.1	Oct.	1	12 36.9		24		9 51.4

WASHINGTON MEAN TIME.		
FEBRUARY.		

THE SATELLITES OF JUPITER

ARE NOT VISIBLE UNTIL FEBRUARY 12,

JUPITER BEING TOO NEAR TO THE SUN.

d h m s				d h m s					d h m s			
12 15 28 53.2	I.	Ec.	Dis.	17 22 34	IV.	Tr.	In.	24 3 38	I.	Sh.	In.
18 16	I.	Oc.	Re.	22 54 29.4	I.	Ec.	Dis.	4 19	I.	Tr.	In.
13 1 58	II.	Sh.	In.	18 1 47	I.	Oc.	Re.	5 58	I.	Sh.	Eg.
2 58	II.	Tr.	In.	2 51	IV.	Tr.	Eg.	6 39	I.	Tr.	Eg.
4 53	II.	Sh.	Eg.	10 27 34.6	II.	Ec.	Dis.	18 13	III.	Sh.	In.
5 53	II.	Tr.	Eg.	14 32	II.	Oc.	Re.	21 00	III.	Tr.	In.
12 48	I.	Sh.	In.	20 13	I.	Sh.	In.	21 46	III.	Sh.	Eg.
13 18	I.	Tr.	In.	20 49	I.	Tr.	In.	25 0 35	III.	Tr.	Eg.
15 07	I.	Sh.	Eg.	22 33	I.	Sh.	Eg.	0 48 32.4	I.	Ec.	Dis.
15 38	I.	Tr.	Eg.	23 09	I.	Tr.	Eg.	3 48	I.	Oc.	Re.
14 0 21 27.1	III.	Ec.	Dis.	19 17 22 58.3	I.	Ec.	Dis.	13 02 54.0	II.	Ec.	Dis.
5 56	III.	Oc.	Re.	20 17	I.	Oc.	Re.	17 20	II.	Oc.	Re.
9 57 26.3	I.	Ec.	Dis.	20 4 33	II.	Sh.	In.	22 07	I.	Sh.	In.
12 46	I.	Oc.	Re.	5 48	II.	Tr.	In.	22 49	I.	Tr.	In.
21 09 49.9	II.	Ec.	Dis.	7 29	II.	Sh.	Eg.	26 0 27	I.	Sh.	Eg.
15 1 07	II.	Oc.	Re.	8 43	II.	Tr.	Eg.	1 09	I.	Tr.	Eg.
7 16	I.	Sh.	In.	14 42	I.	Sh.	In.	1 57 48.9	IV.	Ec.	Dis.
7 48	I.	Tr.	In.	15 19	I.	Tr.	In.	6 07 26.5	IV.	Ec.	Re.
9 36	I.	Sh.	Eg.	17 01	I.	Sh.	Eg.	8 30	IV.	Oc.	Dis.
10 08	I.	Tr.	Eg.	17 39	I.	Tr.	Eg.	12 56	IV.	Oc.	Re.
16 4 25 54.6	I.	Ec.	Dis.	21 4 21 20.6	III.	Ec.	Dis.	19 17 00.8	I.	Ec.	Dis.
7 16	I.	Oc.	Re.	10 25	III.	Oc.	Re.	22 18	I.	Oc.	Re.
15 16	II.	Sh.	In.	11 51 30.8	I.	Ec.	Dis.	27 7 09	II.	Sh.	In.
16 23	II.	Tr.	In.	14 47	I.	Oc.	Re.	8 37	II.	Tr.	In.
18 11	II.	Sh.	Eg.	23 45 16.0	II.	Ec.	Dis.	10 05	II.	Sh.	Eg.
19 18	II.	Tr.	Eg.	22 3 56	II.	Oc.	Re.	11 32	II.	Tr.	Eg.
17 1 45	I.	Sh.	In.	9 10	I.	Sh.	In.	16 35	I.	Sh.	In.
2 18	I.	Tr.	In.	9 49	I.	Tr.	In.	17 19	I.	Tr.	In.
4 04	I.	Sh.	Eg.	11 30	I.	Sh.	Eg.	18 55	I.	Sh.	Eg.
4 38	I.	Tr.	Eg.	12 09	I.	Tr.	Eg.	19 39	I.	Tr.	Eg.
14 14	III.	Sh.	In.	23 6 19 58.4	I.	Ec.	Dis.	28 8 20 36.0	III.	Ec.	Dis.
16 33	III.	Tr.	In.	9 17	I.	Oc.	Re.	13 45 32.7	I.	Ec.	Dis.
17 13	IV.	Sh.	In.	17 51	II.*	Sh.	In.	14 52	III.	Oc.	Re.
17 46	III.	Sh.	Eg.	19 12	II.	Tr.	In.	16 48	I.	Oc.	Re.
20 07	III.	Tr.	Eg.	20 47	II.	Sh.	Eg.				
21 26	IV.	Sh.	Eg.	22 08	II.	Tr.	Eg.				

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.   d *

III.   d *

II.   d *

IV.   d * r *

Configurations at 18ʰ 00ᵐ for an Inverting Telescope.

Day.	West.	East.
1		O
2		O
3		O
4		O
5		O
6		O
7		O
8		O
9		O
10		O
11		O
12	·3	O 2· ·4 ·1 ●
13	2· ·3 1·	O ·4
14	·2	O ·1 ·3 4·
15	1·	O ·2 ·3 4·
16	O 2·	O 1· 3·,4·
17	O 3· ·2 ·1	O 4·
18	3· 4·	O 1·,·2
19	4· ·3	O 2· ·1 ●
20	4· ·32· 1·	O
21	4· ·2	O ·1 ·3
22	·4 1·	O ·2 ·3
23	·4	O 2· ·1 3·
24	·4 2· 1·	O 3·
25	3· ·4	O ·2 1·
26	·3 ·1	O ·4 2·
27	O 1· ·3 2·	O ·4
28	·2	O ·1·3 ·4

WASHINGTON MEAN TIME.

MARCH.

d	h	m	s	Sat.	Ph.	Pos.
1	2	20	29.1	II.	Ec.	Dis.
	6	44		II.	Oc.	Re.
	11	04		I.	Sh.	In.
	11	49		I.	Tr.	In.
	13	24		I.	Sh.	Eg.
	14	09		I.	Tr.	Eg.
2	8	13	59.6	I.	Ec.	Dis.
	11	18		I.	Oc.	Re.
	20	27		II.	Sh.	In.
	22	01		II.	Tr.	In.
	23	23		II.	Sh.	Eg.
3	0	57		II.	Tr.	Eg.
	5	32		I.	Sh.	In.
	6	20		I.	Tr.	In.
	7	52		I.	Sh.	Eg.
	8	40		I.	Tr.	Eg.
	22	12		III.	Sh.	In.
4	1	25		III.	Tr.	In.
	1	46		III.	Sh.	Eg.
	2	42	33.2	I.	Ec.	Dis.
	5	02		III.	Tr.	Eg.
	5	48		I.	Oc.	Re.
	15	38	01.0	II.	Ec.	Dis.
	20	08		II.	Oc.	Re.
5	0	01		I.	Sh.	In.
	0	50		I.	Tr.	In.
	2	21		I.	Sh.	Eg.
	3	10		I.	Tr.	Eg.
	21	11	01.0	I.	Ec.	Dis.
6	0	18		I.	Oc.	Re.
	9	45		II.	Sh.	In.
	11	19		IV.	Sh.	In.
	11	25		II.	Tr.	In.
	12	41		II.	Sh.	Eg.
	14	21		II.	Tr.	Eg.
	15	37		IV.	Sh.	Eg.
	18	29		I.	Sh.	In.
	19	03		IV.	Tr.	In.
	19	20		I.	Tr.	In.
	20	49		I.	Sh.	Eg.
	21	40		I.	Tr.	Eg.
	23	29		IV.	Tr.	Eg.
7	12	19	48.0	III.	Ec.	Dis.
	15	39	32.8	I.	Ec.	Dis.
	18	48		I.	Oc.	Re.
	19	18		III.	Oc.	Re.
8	4	55	29.8	II.	Ec.	Dis.
	9	32		II.	Oc.	Re.
	12	58		I.	Sh.	In.
	13	49		I.	Tr.	In.
	15	18		I.	Sh.	Eg.
	16	09		I.	Tr.	Eg.
9	10	07	59.0	I.	Ec.	Dis.
	13	18		I.	Oc.	Re.
	23	03		II.	Sh.	In.
10	0	49		II.	Tr.	In.
	1	59		II.	Sh.	Eg.
	3	45		II.	Tr.	Eg.
	7	26		I.	Sh.	In.
	8	19		I.	Tr.	In.
	9	46		I.	Sh.	Eg.
	10	39		I.	Tr.	Eg.
11	2	12		III.	Sh.	In.
	4	36	32.0	I.	Ec.	Dis.
	5	46		III.	Sh.	Eg.
	5	49		III.	Tr.	In.
	7	48		I.	Oc.	Re.
	9	26		III.	Tr.	Eg.

d	h	m	s	Sat.	Ph.	Pos.
11	18	12	55.5	II.	Ec.	Dis.
	22	55		II.	Oc.	Re.
12	1	54		I.	Sh.	In.
	2	49		I.	Tr.	In.
	4	14		I.	Sh.	Eg.
	5	09		I.	Tr.	Eg.
	23	04	59.2	I.	Ec.	Dis.
13	2	18		I.	Oc.	Re.
	12	21		II.	Sh.	In.
	14	13		II.	Tr.	In.
	15	17		II.	Sh.	Eg.
	17	09		II.*	Tr.	Eg.
	20	23		I.	Sh.	In.
	21	19		I.	Tr.	In.
	22	43		I.	Sh.	Eg.
	23	39		I.	Tr.	Eg.
14	16	18	39.6	III.	Ec.	Dis.
	17	33	30.6	I.*	Ec.	Dis.
	19	44	10.0	III.	Ec.	Re.
	20	00	53.4	IV.	Ec.	Dis.
	20	03		III.	Oc.	Dis.
	20	48		I.	Oc.	Re.
	23	41		III.	Oc.	Re.
15	0	15	17.2	IV.	Ec.	Re.
	4	46		IV.	Oc.	Dis.
	7	30	18.3	II.	Ec.	Dis.
	9	20		IV.	Oc.	Re.
	12	18		II.	Oc.	Re.
	14	51		I.	Sh.	In.
	15	49		I.	Tr.	In.
	17	11		I.*	Sh.	Eg.
	18	09		I.	Tr.	Eg.
16	12	01	56.3	I.	Ec.	Dis.
	15	18		I.	Oc.	Re.
17	1	39		II.	Sh.	In.
	3	36		II.	Tr.	In.
	4	35		II.	Sh.	Eg.
	6	33		II.	Tr.	Eg.
	9	20		I.	Sh.	In.
	10	19		I.	Tr.	In.
	11	40		I.	Sh.	Eg.
	12	39		I.	Tr.	Eg.
18	6	11		III.	Sh.	In.
	6	30	29.0	I.	Ec.	Dis.
	9	46		III.	Sh.	Eg.
	9	48		I.	Oc.	Re.
	10	11		III.	Tr.	In.
	13	49		III.	Tr.	Eg.
	20	47	38.3	II.	Ec.	Dis.
19	1	41		II.	Oc.	Re.
	3	48		I.	Sh.	In.
	4	48		I.	Tr.	In.
	6	08		I.	Sh.	Eg.
	7	08		I.	Tr.	Eg.
20	0	58	55.8	I.	Ec.	Dis.
	4	18		I.	Oc.	Re.
	14	57		II.	Sh.	In.
	16	59		II.*	Tr.	In.
	17	53		II.	Sh.	Eg.
	19	56		II.	Tr.	Eg.
	22	17		I.	Sh.	In.
	23	18		I.	Tr.	In.
21	0	37		I.	Sh.	Eg.
	1	38		I.	Tr.	Eg.
	19	27	27.1	I.	Ec.	Dis.
	20	17	31.3	III.	Ec.	Dis.
	22	48		I.	Oc.	Re.
	23	43	35.5	III.	Ec.	Re.

d	h	m	s	Sat.	Ph.	Pos.
22	0	24		III.	Oc.	Dis.
	4	03		III.	Oc.	Re.
	10	04	55.7	II.	Ec.	Dis.
	15	03		II.	Oc.	Re.
	16	45		I.*	Sh.	In.
	17	48		I.	Tr.	In.
	19	05		I.	Sh.	Eg.
	20	08		I.	Tr.	Eg.
23	5	24		IV.	Sh.	In.
	9	47		IV.	Sb.	Eg.
	13	55	52.5	I.	Ec.	Dis.
	15	08		IV.	Tr.	In.
	17	17		I.*	Oc.	Re.
	19	42		IV.	Tr.	Eg.
24	4	16		II.	Sh.	In.
	6	23		II.	Tr.	In.
	7	11		II.	Sh.	Eg.
	9	19		II.	Tr.	Eg.
	11	13		I.	Sh.	In.
	12	17		I.	Tr.	In.
	13	33		I.	Sh.	Eg.
	14	37		I.	Tr.	Eg.
25	8	24	25.0	I.	Ec.	Dis.
	10	10		III.	Sh.	In.
	11	47		I.	Oc.	Re.
	13	46		III.	Sh.	Eg.
	14	31		III.	Tr.	In.
	18	10		III.	Tr.	Eg.
	23	22	10.6	II.	Ec.	Dis.
26	4	25		II.	Oc.	Re.
	5	42		I.	Sh.	In.
	6	47		I.	Tr.	In.
	8	02		I.	Sh.	Eg.
	9	07		I.	Tr.	Eg.
27	2	52	51.5	I.	Ec.	Dis.
	6	17		I.	Oc.	Re.
	17	33		II.	Sh.	In.
	19	45		II.	Tr.	In.
	20	29		II.	Sh.	Eg.
	22	42		II.	Tr.	Eg.
28	0	10		I.	Sh.	In.
	1	17		I.	Tr.	In.
	2	30		I.	Sh.	Eg.
	3	37		I.	Tr.	Eg.
	21	21	22.5	I.	Ec.	Dis.
29	0	16	48.3	III.	Ec.	Dis.
	0	46		I.	Oc.	Re.
	3	43	25.3	III.	Ec.	Re.
	4	43		III.	Oc.	Dis.
	8	22		III.	Oc.	Re.
	12	39	23.0	II.	Ec.	Dis.
	17	47		II.	Oc.	Re.
	18	39		I.	Sh.	In.
	19	46		I.	Tr.	In.
	20	59		I.	Sh.	Eg.
	22	06		I.	Tr.	Eg.
30	15	49	47.3	I.*	Ec.	Dis.
	19	16		I.	Oc.	Re.
31	6	52		II.	Sh.	In.
	9	08		II.	Tr.	In.
	9	48		II.	Sh.	Eg.
	12	04		II.	Tr.	Eg.
	13	07		I.	Sh.	In.
	14	03	48.8	IV.	Ec.	Dis.
	14	16		I.	Tr.	In.
	15	27		I.	Sh.	Eg.
	16	36		I.*	Tr.	Eg.
	18	22	37.6	IV.	Ec.	Re.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.   d   *   (disk)

III.   d   *   r   *   (disk)

II.   d   *   (disk)

IV.   d   *   r   *   (disk)

Configurations at 17^h 00^m *for an Inverting Telescope.*

Day.	West.	East.
1	1·	·2 ·3 ·4
2		2··1 3· 4·
3	2· 1·	3· 4·
4	3·	1· 4· ·2●
5	3· ·1	2· 4·
6	·3 2·	4·1·
7	·2 4·	·1● ·3●
8	4· 1·	·2 ·3
9	4·	·1 2· 3·
10	4· 2· 1·	3·
11	·4 3· ·2	·1
12	·4 3· ·1	·2
13	O2· ·4 ·3	1·
14	·2 ·4 ·1	·3●
15	O1·	·1 ·2 ·3
16		·1 2· ·43·
17	2· 1·	3· ·4
18	·23·	·1 ·4
19	3· ·1	·2 4·
20	·3	O2· 1· 4·
21	·2 ·3·1	4·
22		O1··2 ·34·
23	O4·	2· ·3 ·1●
24	4· 2· 1·	3·
25	O3· 4· ·2	·1
26	4· 3· 1·	·2
27	4· ·3	2· 1·
28	·4 2· ·3 ·1	
29	·4	1· ·3 ·2●
30	·4	2· ·3 ·1●
31	2· 1·	3· ·4●

WASHINGTON MEAN TIME.

APRIL.

d	h	m	s			
1	0	37		IV.	Oc.	Dis.
	5	18		IV.	Oc.	Re.
	10	18	19.4	I.	Ec.	Dis.
	13	46		I.	Oc.	Re.
	14	10		III.	Sh.	In.
	17	45		III.	Sh.	Eg.
	18	48		III.	Tr.	In.
	22	28		III.	Tr.	Eg.
2	1	56	33.1	II.	Ec.	Dis.
	7	08		II.	Oc.	Re.
	7	35		I.	Sh.	In.
	8	45		I.	Tr.	In.
	9	55		I.	Sh.	Eg.
	11	05		I.	Tr.	Eg.
3	4	46	45.5	I.	Ec.	Dis.
	8	15		I.	Oc.	Re.
	20	10		II.	Sh.	In.
	22	30		II.	Tr.	In.
	23	06		II.	Sh.	Eg.
4	1	26		II.	Tr.	Eg.
	2	04		I.	Sh.	In.
	3	14		I.	Tr.	In.
	4	24		I.	Sh.	Eg.
	5	34		I.	Tr.	Eg.
	23	15	16.4	I.	Ec.	Dis.
5	2	45		I.	Oc.	Re.
	4	16	00.5	III.	Ec.	Dis.
	7	43	09.1	III.	Ec.	Re.
	8	59		III.	Oc.	Dis.
	12	40		III.	Oc.	Re.
	15	13	41.0	II.	Ec.	Dis.
	20	29		II.	Oc.	Re.
	20	32		I.	Sh.	In.
	21	44		I.	Tr.	In.
	22	52		I.	Sh.	Eg.
6	0	04		I.	Tr.	Eg.
	17	43	41.0	I.	Ec.	Dis.
	21	14		I.	Oc.	Re.
7	9	28		II.	Sh.	In.
	11	52		II.	Tr.	In.
	12	24		II.	Sh.	Eg.
	14	48		II.	Tr.	Eg.
	15	00		I.	Sh.	In.
	16	13		I.*	Tr.	In.
	17	20		I.	Sh.	Eg.
	18	33		I.	Tr.	Eg.
8	12	12	13.0	I.	Ec.	Dis.
	15	43		I.*	Oc.	Re.
	18	08		III.	Sh.	In.
	21	44		III.	Sh.	Eg.
	23	02		III.	Tr.	In.
	23	29		IV.	Sh.	In.
9	2	43		III.	Tr.	Eg.
	3	57		IV.	Sh.	Eg.
	4	30	46.8	II.	Ec.	Dis.
	9	29		I.	Sh.	In.
	9	50		II.	Oc.	Re.
	10	42		I.	Tr.	In.
	10	45		IV.	Tr.	In.
	11	49		I.	Sh.	Eg.
	13	02		I.	Tr.	Eg.
	15	26		IV.*	Tr.	Eg.
10	6	40	39.0	I.	Ec.	Dis.
	10	13		I.	Oc.	Re.
	22	46		II.	Sh.	In.
11	1	13		II.	Tr.	In.
	1	42		II.	Sh.	Eg.
	3	57		I.	Sh.	In.

d	h	m	s			
11	4	10		II.	Tr.	Eg.
	5	11		I.	Tr.	In.
	6	17		I.	Sh.	Eg.
	7	31		I.	Tr.	Eg.
12	1	09	10.1	I.	Ec.	Dis.
	4	42		I.	Oc.	Re.
	8	15	46.4	III.	Ec.	Dis.
	11	43	25.4	III.	Ec.	Re.
	13	13		III.	Oc.	Dis.
	16	54		III.*	Oc.	Re.
	17	47	51.0	II.	Ec.	Dis.
	22	25		I.	Sh.	In.
	23	10		II.	Oc.	Re.
	23	40		I.	Tr.	In.
13	0	45		I.	Sh.	Eg.
	2	00		I.	Tr.	Eg.
	19	37	34.3	I.	Ec.	Dis.
	23	11		I.	Oc.	Re.
14	12	05		II.	Sh.	In.
	14	35		II.	Tr.	In.
	15	01		II.	Sh.	Eg.
	16	54		I.*	Sh.	In.
	17	31		II.	Tr.	Eg.
	18	09		I.	Tr.	In.
	19	14		I.	Sh.	Eg.
	20	29		I.	Tr.	Eg.
15	14	06	06.2	I.	Ec.	Dis.
	17	41		I.	Oc.	Re.
	22	06		III.	Sh.	In.
16	1	43		III.	Sh.	Eg.
	3	14		III.	Tr.	In.
	6	55		III.	Tr.	Eg.
	7	04	53.0	II.	Ec.	Dis.
	11	22		I.	Sh.	In.
	12	30		II.	Oc.	Re.
	12	39		I.	Tr.	In.
	13	42		I.	Sh.	Eg.
	14	59		I.*	Tr.	Eg.
17	8	06	39.7	IV.	Ec.	Dis.
	8	34	32.4	I.	Ec.	Dis.
	12	10		I.	Oc.	Re.
	12	29	31.5	IV.	Ec.	Re.
	19	54		IV.	Oc.	Dis.
18	0	42		IV.	Oc.	Re.
	1	23		II.	Sh.	In.
	3	55		II.	Tr.	In.
	4	19		II.	Sh.	Eg.
	5	50		I.	Sh.	In.
	6	52		II.	Tr.	Eg.
	7	08		I.	Tr.	In.
	8	10		I.	Sh.	Eg.
	9	28		I.	Tr.	Eg.
19	3	03	03.5	I.	Ec.	Dis.
	6	39		I.	Oc.	Re.
	12	14	55.7	III.	Ec.	Dis.
	15	43	04.0	III.*	Ec.	Re.
	17	23		III.	Oc.	Dis.
	20	21	53.2	II.	Ec.	Dis.
	21	05		III.	Oc.	Re.
20	0	19		I.	Sh.	In.
	1	37		I.	Tr.	In.
	1	49		II.	Oc.	Re.
	2	39		I.	Sh.	Eg.
	3	57		I.	Tr.	Eg.
	21	31	27.4	I.	Ec.	Dis.
21	1	08		I.	Oc.	Re.
	14	41		II.	Sh.	In.

d	h	m	s			
21	17	16		II.	Tr.	In.
	17	37		II.	Sh.	Eg.
	18	47		I.	Sh.	In.
	20	05		I.	Tr.	In.
	20	13		II.	Tr.	Eg.
	21	07		I.	Sh.	Eg.
	22	25		I.	Tr.	Eg.
22	15	59	59.4	I.*	Ec.	Dis.
	19	37		I.	Oc.	Re.
23	2	05		III.	Sh.	In.
	5	42		III.	Sh.	Eg.
	7	22		III.	Tr.	In.
	9	38	52.1	II.	Ec.	Dis.
	11	04		III.	Tr.	Eg.
	13	15		I.	Sh.	In.
	14	34		I.	Tr.	In.
	15	08		II.*	Oc.	Re.
	15	35		I.*	Sh.	Eg.
	16	54		I.	Tr.	Eg.
24	10	28	25.4	I.	Ec.	Dis.
	14	06		I.	Oc.	Re.
25	3	59		II.	Sh.	In.
	6	36		II.	Tr.	In.
	6	56		II.	Sh.	Eg.
	7	44		I.	Sh.	In.
	9	03		I.	Tr.	In.
	9	32		II.	Tr.	Eg.
	10	04		I.	Sh.	Eg.
	11	23		I.	Tr.	Eg.
	17	34		IV.	Sh.	In.
	22	07		IV.	Sh.	Eg.
26	4	56	56.5	I.	Ec.	Dis.
	5	44		IV.	Tr.	In.
	8	35		I.	Oc.	Re.
	10	32		IV.	Tr.	Eg.
	16	14	05.0	III.*	Ec.	Dis.
	19	42	41.2	III.	Ec.	Re.
	21	30		III.	Oc.	Dis.
	22	55	49.8	II.	Ec.	Dis.
27	1	12		III.	Oc.	Re.
	2	12		I.	Sh.	In.
	3	32		I.	Tr.	In.
	4	27		II.	Oc.	Re.
	4	32		I.	Sh.	Eg.
	5	52		I.	Tr.	Eg.
	23	25	20.5	I.	Ec.	Dis.
28	3	04		I.	Oc.	Re.
	17	18		II.	Sh.	In.
	19	56		II.	Tr.	In.
	20	14		II.	Sh.	Eg.
	20	40		I.	Sh.	In.
	22	01		I.	Tr.	In.
	22	52		II.	Tr.	Eg.
	23	00		I.	Sh.	Eg.
29	0	21		I.	Tr.	Eg.
	17	53	52.6	I.	Ec.	Dis.
	21	32		I.	Oc.	Re.
30	6	04		III.	Sh.	In.
	9	42		III.	Sh.	Eg.
	11	27		III.	Tr.	In.
	12	12	46.2	II.	Ec.	Dis.
	15	09		I.*	Sh.	In.
	15	09		III.*	Tr.	Eg.
	16	29		I.*	Tr.	In.
	17	29		I.	Sh.	Eg.
	17	45		II.	Oc.	Re.
	18	49		I.	Tr.	Eg.

NOTE.—In., denotes ingress ; Eg., egress ; Dis., disappearance ; Re., reappearance ; Ec., eclipse. Oc., denotes occultation ; Tr., transit of the satellite ; Sh., transit of the shadow ; * Visible at Washington.

WASHINGTON MEAN TIME.

APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.	d $*$	III.	d $*$ r $*$
II.	d $*$	IV.	d $*$ r $*$

Configurations at 15^h 30^m for an Inverting Telescope.

Day.	West.		East.
1	·2	○	₃·⁴1 ·4
2	3· 1·	○	·2 ·4
3	3·	○	₂·⁴1 ·4
4	·₂³ ·1	○	·4
5		○	·3 1· 4· ·2●
6	·1	○	·2 ·3 4·
7	2· ○ 1·		3· 4·
8	·2	○	3· 4· ·1●
9	3· 1· 4·	○	·2
10	3· 4·	○	·1 2·
11	4· ·3 2· 1·	○	
12	4·	·2 ○ 1·	·3●
13	4·	·1 ○	·2 ·3
14	○2· ·4	○	1· 3·
15	·4 ·2	○	3· ·1●
16	·4 3· 1· ○ ·2		
17	3· ·4 ○	·1 2·	
18	·3 2·1·	○	·4
19	·2	○	·1 ·4 ·3●
20	·1	○	·2 ·3 ·4
21		○ 2· 1·	3· ·4
22	2· ·1 ○	3· 4·
23	○1·	3· ○ ·2	4·
24	3·	○ ·1 2· 4·	
25	·3 ₂·1·	○	4·
26	·2 ·₄³	○	·1
27	4· ·1	○	·₂³
28	4·	○ 2·1·	·3
29	4·	2· ·1 ○	3·
30	·4	3· ○ 1·	·2●

WASHINGTON MEAN TIME.

MAY.

d	h	m	s			
1	12	22	18.7	I.	Ec.	Dis.
	16	01		I.	Oc.	Re.
2	6	36		II.	Sh.	In.
	9	15		II.	Tr.	In.
	9	32		II.	Sh.	Eg.
	9	37		I.	Sh.	In.
	10	58		I.	Tr.	In.
	11	57		I.	Sh.	Eg.
	12	11		II.	Tr.	Eg.
	13	18		I.	Tr.	Eg.
3	6	50	50.2	I.	Ec.	Dis.
	10	30		I.	Oc.	Re.
	20	12	56.7	III.	Ec.	Dis.
	23	42	00.0	III.	Ec.	Re.
4	1	29	41.4	II.	Ec.	Dis.
	1	33		III.	Oc.	Dis.
	2	10	15.2	IV.	Ec.	Dis.
	4	05		I.	Sh.	In.
	5	15		III.	Oc.	Re.
	5	26		I.	Tr.	In.
	6	25		I.	Sh.	Eg.
	6	36	46.6	IV.	Ec.	Re.
	7	02		II.	Oc.	Re.
	7	46		I.	Tr.	Eg.
	14	32		IV.*	Oc.	Dis.
	19	22		IV.	Oc.	Re.
5	1	19	14.5	I.	Ec.	Dis.
	4	58		I.	Oc.	Re.
	19	54		II.	Sh.	In.
	22	34		I.	Sh.	In.
	22	34		II.	Tr.	In.
	22	50		II.	Sh.	Eg.
	23	54		I.	Tr.	In.
6	0	54		I.	Sh.	Eg.
	1	30		II.	Tr.	Eg.
	2	15		I.	Tr.	Eg.
	19	47	46.7	I.	Ec.	Dis.
	23	27		I.	Oc.	Re.
7	10	04		III.	Sh.	In.
	13	42		III.	Sh.	Eg.
	14	46	35.8	II.*	Ec.	Dis.
	15	29		III.*	Tr.	In.
	17	02		I.	Sh.	In.
	18	23		I.	Tr.	In.
	19	11		III.	Tr.	Eg.
	19	22		I.	Sh.	Eg.
	20	19		II.	Oc.	Re.
	20	43		I.	Tr.	Eg.
8	14	16	13.2	I.*	Ec.	Dis.
	17	55		I.	Oc.	Re.
9	9	12		II.	Sh.	In.
	11	30		I.	Sh.	In.
	11	52		II.	Tr.	In.
	12	09		II.	Sh.	Eg.
	12	51		I.	Tr.	In.
	13	50		I.*	Sh.	Eg.
	14	48		II.*	Tr.	Eg.
	15	12		I.*	Tr.	Eg.
10	8	44	45.0	I.	Ec.	Dis.
	12	24		I.	Oc.	Re.
11	0	11	53.4	III.	Ec.	Dis.
	3	41	22.0	III.	Ec.	Re.
	4	03	30.0	II.	Ec.	Dis.
	5	32		III.	Oc.	Dis.
	5	59		I.	Sh.	In.
	7	19		I.	Tr.	In.
	8	19		I.	Sh.	Eg.
	9	15		III.	Oc.	Re.
11	9	36		II.	Oc.	Re.
	9	40		I.	Tr.	Eg.
12	3	13	09.4	I.	Ec.	Dis.
	6	52		I.	Oc.	Re.
	11	41		IV.	Sh.	In.
	16	17		IV.*	Sh.	Eg.
	22	31		II.	Sh.	In.
	23	59		IV.	Tr.	In.
13	0	27		I.	Sh.	In.
	1	10		II.	Tr.	In.
	1	27		II.	Sh.	Eg.
	1	47		I.	Tr.	In.
	2	47		I.	Sh.	Eg.
	4	06		II.	Tr.	Eg.
	4	08		I.	Tr.	Eg.
	4	50		IV.	Tr.	Eg.
	21	41	42.0	I.	Ec.	Dis.
14	1	20		I.	Oc.	Re.
	14	03		III.	Sh.	In.
	17	20	23.5	II.	Ec.	Dis.
	17	42		III.	Sh.	Eg.
	18	55		I.	Sh.	In.
	19	26		III.	Tr.	In.
	20	15		I.	Tr.	In.
	21	15		I.	Sh.	Eg.
	22	36		I.	Tr.	Eg.
	22	52		II.	Oc.	Re.
	23	08		III.	Tr.	Eg.
15	16	10	07.7	I.*	Ec.	Dis.
	19	49		I.	Oc.	Re.
16	11	49		II.	Sh.	In.
	13	24		I.*	Sh.	In.
	14	27		II.*	Tr.	In.
	14	44		I.*	Tr.	In.
	14	46		II.*	Sh.	Eg.
	15	44		I.*	Sh.	Eg.
	17	04		I.	Tr.	Eg.
	17	23		II.	Tr.	Eg.
17	10	38	41.1	I.	Ec.	Dis.
	14	17		I.*	Oc.	Re.
18	4	11	20.2	III.	Ec.	Dis.
	6	37	16.4	II.	Ec.	Dis.
	7	41	13.0	III.	Ec.	Re.
	7	52		I.	Sh.	In.
	9	12		I.	Tr.	In.
	9	28		III.	Oc.	Dis.
	10	12		I.	Sh.	Eg.
	11	32		I.	Tr.	Eg.
	12	08		II.	Oc.	Re.
	13	10		III.*	Oc.	Re.
19	5	07	06.0	I.	Ec.	Dis.
	8	45		I.	Oc.	Re.
20	1	08		II.	Sh.	In.
	2	20		I.	Sh.	In.
	3	40		I.	Tr.	In.
	3	44		II.	Tr.	In.
	4	04		II.	Sh.	Eg.
	4	40		I.	Sh.	Eg.
	6	00		I.	Tr.	Eg.
	6	40		II.	Tr.	Eg.
	20	13	56.3	IV.	Ec.	Dis.
	23	35	38.8	I.	Ec.	Dis.
21	0	43	47.5	IV.	Ec.	Re.
	3	13		I.	Oc.	Re.
	8	19		IV.	Oc.	Dis.
	13	12		IV.*	Oc.	Re.
	18	02		III.	Sh.	In.
	19	54	09.5	II.	Ec.	Dis.
21	20	49		I.	Sh.	In.
	21	41		III.	Sh.	Eg.
	22	07		I.	Tr.	In.
	23	09		I.	Sh.	Eg.
	23	18		III.	Tr.	In.
22	0	28		I.	Tr.	Eg.
	1	22		II.	Oc.	Re.
	3	01		III.	Tr.	Eg.
	18	04	06.0	I.	Ec.	Dis.
	21	41		I.	Oc.	Re.
23	14	26		II.*	Sh.	In.
	15	17		I.*	Sh.	In.
	16	35		I.	Tr.	In.
	17	00		II.	Tr.	In.
	17	22		II.	Sh.	Eg.
	17	37		I.	Sh.	Eg.
	18	56		I.	Tr.	Eg.
	19	56		II.	Tr.	Eg.
24	12	32	39.0	I.	Ec.	Dis.
	16	09		I.	Oc.	Re.
25	8	10	43.4	III.	Ec.	Dis.
	9	11	02.9	II.	Ec.	Dis.
	9	45		I.	Sh.	In.
	11	03		I.	Tr.	In.
	11	40	59.0	III.	Ec.	Re.
	12	05		I.	Sh.	Eg.
	13	19		III.*	Oc.	Dis.
	13	23		I.*	Tr.	Eg.
	14	37		II.*	Oc.	Re.
	17	02		III.	Oc.	Re.
26	7	01	04.1	I.	Ec.	Dis.
	10	37		I.	Oc.	Re.
27	3	45		II.	Sh.	In.
	4	14		I.	Sh.	In.
	5	31		I.	Tr.	In.
	6	16		II.	Tr.	In.
	6	34		II.	Sh.	Eg.
	6	41		I.	Sh.	Eg.
	7	51		I.	Tr.	Eg.
	9	12		II.	Tr.	Eg.
28	1	29	37.5	I.	Ec.	Dis.
	5	05		I.	Oc.	Re.
	22	00		III.	Sh.	In.
	22	27	56.4	II.	Ec.	Dis.
	22	42		I.	Sh.	In.
	23	58		I.	Tr.	In.
29	1	02		I.	Sh.	Eg.
	1	40		III.	Sh.	Eg.
	2	19		I.	Tr.	Eg.
	3	07		III.	Tr.	In.
	3	51		II.	Oc.	Re.
	5	47		IV.	Sh.	In.
	6	49		III.	Tr.	Eg.
	10	27		IV.	Sh.	Eg.
	17	22		IV.	Tr.	In.
	19	58	05.3	I.	Ec.	Dis.
	22	15		IV.	Tr.	Eg.
	23	32		I.	Oc.	Re.
30	17	03		II.	Sh.	In.
	17	10		I.	Sh.	In.
	18	26		I.	Tr.	In.
	19	30		I.	Sh.	Eg.
	19	32		II.	Tr.	In.
	19	59		II.	Sh.	Eg.
	20	46		I.	Tr.	Eg.
	22	28		II.	Tr.	Eg.
31	14	26	39.0	I.*	Ec.	Dis.
	18	00		I.	Oc.	Re.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

· WASHINGTON MEAN TIME.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. d ✳	III. d ✳ r ✳	
II. d ✳	IV. d ✳ r ✳	

Configurations at 14ʰ 30ᵐ for an Inverting Telescope.

Day.	West.		East.
1	·4 3·	○ 2·	·1●
2	·4 ·3 1:	○	
3	·4 ·2 ·3	○ ·1	
4	1·	○ :3 :2	·4●
5		○ 1: ·4 ·3	
6	·1 2·	○ 3· ·4	
7	·2	○ 3· 1·	·4
8	3·	○ ·2	·4 ·1●
9	○2· ○1· ·3	○	4·
10	:3 :2	○ ·1	4·
11	1·	○ :3 :2 4·	
12		○ 4· ·12· ·3	
13	2· ·1:	○ 3·	
14	4· ·2	○ 3· 1·	
15	4· 3· ·1	○ ·2	
16	4· 3·	○ 1:	
17	·4 ·3 ·2	○ ·1	
18	·4 1·	○ ·3 ·2	
19	·4	○ ·1 2· ·3	
20	·4 1:	○ 3·	
21	·2	○ ·4 1:	
22	3· ·1	○ ·2 ·4	
23	3·	○ 1:	·4
24	·3 2·	○	·4 ·1●
25	1·	○	·4 :2●
26		○ ·1 ·: ·3	·4
27	1· 2·	○ 3· ·4	
28	·2	○ 1· 3· 4·	
29	·1 3.	○ 4· ·2	
30	3· 4·	○ 1:	
31	4· ·3 2·	○	·1●

WASHINGTON MEAN TIME.

JUNE.

d	h	m	t			
1	11	39		I	Sh	In
	11	44	50.5	I	Ec	Dis
	12	10	45.9	III	Ec	Dis.
	12	53		I	Tr	In
	13	59		I	Sh	Eg
	15	13		I	Tr	Eg
	15	43	20.9	III	Ec	Re
	17	05		II	Oc	Re
	17	06		III	Oc	Dis
	20	09		III	Oc	Re
2	8	55	05.0	I	Ec	Dis.
	12	27		I	Oc	Re.
3	6	07		I	Sh	In
	6	21		II	Sh	In
	7	20		I	Tr	In
	8	27		I	Sh	Eg
	8	46		II	Tr	In
	9	18		II	Sh	Eg
	9	41		I	Tr	Eg
	11	42		II	Tr	Eg
4	3	23	39.0	I	Ec	Dis
	6	55		I	Oc	Re.
5	0	55		I	Sh	In
	1	03	45.0	II	Ec	Dis
	1	48		I	Tr	In
	1	59		III	Sh	In
	2	55		I	Sh	Eg
	4	08		I	Tr	Eg
	5	59		III	Sh	Eg
	6	13		II	Oc	Re.
	6	50		III	Tr	In
	10	55		III	Tr	Eg
	21	52	07.5	I	Ec	Dis.
6	1	22		I	Oc	Re
	14	17	52.7	IV	Ec	Dis
	15	50	46.1	IV	Ec	Re.
	19	04		I	Sh	In
	19	40		II	Sh	In
	20	15		I	Tr	In.
	21	24		I	Sh	Eg
	22	00		II	Tr	In.
	22	35		I	Tr	Eg
	22	46		II	Sh	Eg
7	0	57		II	Tr	Eg
	1	12		IV	Oc	Dis.
	6	06		IV	Oc	Re.
	16	20	42.1	I.	Ec	Dis.
	19	50		I.	Oc	Re.
8	13	52		I	Sh	In
	14	18	41.5	II	Ec	Dis.
	14	42		I	Tr	In.
	15	52		I	Sh	Eg.
	16	10	11.1	III	Ec	Dis.
	17	03		I	Tr	Eg.
	19	30		II	Oc	Re.
	19	41	08.3	III	Ec	Re.
	20	48		III	Oc	Dis.
9	0	31		III	Oc	Re.
	10	49	00.0	I.	Ec	Dis.
	14	17		I.*	Oc	Re.
10	8	00		I.	Sh	In.
	8	58		II.	Sh	In.
	9	09		I.	Tr	In.
	10	20		I.	Sh	Eg.
	11	14		II.	Tr	In.
	11	30		I.*	Tr	Eg.

d	h	m	t			
10	11	55		II*	Sh	Eg
	14	10		II*	Tr	Eg
11	5	27	45.7	I	Ec	Dis
	8	44		I	Oc	Re
12	2	29		I	Sh	In
	2	35	38.6	II	Ec	Dis.
	3	36		I	Tr	In
	4	49		I	Sh	Eg
	5	57		I	Tr	Eg
	5	58		III	Sh	In
	8	42		II	Oc	Re
	9	39		III	Sh	Eg
	10	29		III	Tr	In
	14	12		III*	Tr	Eg
	23	46	33.0	I	Ec	Dis
13	3	12		I	Oc	Re
	20	57		I	Sh	In
	22	03		I	Tr	In
	22	17		II	Sh	In
	23	17		I	Sh	Eg
14	0	24		I	Tr	Eg
	0	27		II	Tr	In
	1	13		II	Sh	Eg
	3	23		II	Tr	Eg
	14	14	45.5	I	Ec	Dis.
	21	39		I.	Oc	Re
	23	54		IV	Sh	In
15	4	37		IV	Sh	Eg
	9	45		IV	Tr	In
	14	42		IV*	Tr	Eg
	15	25		I*	Sh	In.
	16	30		I.	Tr	In
	16	52	36.9	II.	Ec	Dis.
	17	45		I.	Sh	Eg
	18	51		I.	Tr	Eg.
	20	09	39.6	III.	Ec	Dis.
	21	53		II.	Oc	Re.
	23	40	55.8	III.	Ec	Re.
16	0	25		III.	Oc	Dis.
	4	08		III.	Oc	Re.
	12	43	16.2	I.*	Ec	Dis.
	16	06		I.*	Oc	Re.
17	9	54		I.	Sh	In.
	10	57		I.*	Tr	In.
	11	35		II.*	Sh	In.
	12	14		I.*	Sh	Eg.
	13	17		I.*	Tr	Eg.
	13	40		II.*	Tr	In.
	14	32		II.*	Sh	Eg.
	16	36		II.	Tr	Eg.
18	7	11	51.7	I.	Ec	Dis.
	10	32		I.	Oc	Re.
19	4	22		I.	Sh	In.
	5	24		I.	Tr	In.
	6	09	36.7	II.	Ec	Dis.
	6	42		I.	Sh	Eg.
	7	44		I.	Tr	Eg.
	9	58		III.	Sh	In.
	11	04		II.*	Oc	Re.
	13	38		III.*	Sh	Eg.
	14	04		III.*	Tr	In.
	17	47		III.	Tr	Eg.
20	1	40	22.2	I.	Ec	Dis.
	4	59		I.	Oc	Re.
	22	51		I.	Sh	In.
	23	50		I.	Tr	In.

d	h	m	t			
21	0	54		II	Sh	In.
	1	11		II.	Sh	Eg
	2	11		I	Tr	In
	2	52		II	Tr	In
	3	30		II.	Sh	Eg
	5	08		II	Tr	Eg
	20	08	56.?	I	Ec	Dis
	23	26		I	Oc	Re.
22	2	19		I	Sh	In
	3	27		I	Tr	In
	19	26	34.?	II	Ec	Dis
	19	39		II.	Sh	Eg
	20	37		I	Tr	Eg
23	0	08	57.?	III	Ec	Dis
	0	12		III	Oc	Dis.
	3	20	32.8	III	Ec	Re.
	3	57		III	Oc	Dis.
	7	00		III	Oc	Re.
	8	23	09.9	IV	Ec	Dis.
	12	58	31.2	IV*	Ec	Re.
	14	37	27.0	I*	Ec	Dis.
	17	07		IV	Oc	Dis.
	17	53		I	Oc	Re.
	22	02		IV	Oc	Re.
24	11	47		I*	Sh	In.
	12	44		I*	Tr	In.
	14	07		I*	Sh	Eg.
	14	12		II*	Sh	In.
	15	04		I*	Tr	Eg.
	16	04		II.*	Tr	In.
	17	09		II.	Sh	Eg.
	19	00		II.	Tr	Eg.
25	9	06	04.4	I	Ec	Dis.
	12	20		I*	Oc	Re.
26	6	16		I	Sh	In.
	7	10		I	Tr	In.
	8	36		I	Sh	Eg.
	8	43	41.9	II.	Ec	Dis.
	9	31		I.	Tr	Eg.
	13	24		II.*	Oc	Re.
	13	57		III.*	Sh	In.
	17	35		III.	Tr	In.
	17	38		III.	Sh	Eg.
	21	18		III.	Tr	Eg.
27	3	34	36.0	I	Ec	Dis.
	6	47		I	Oc	Re.
28	0	44		I.	Sh	In.
	1	37		I.	Tr	In.
	3	04		I.	Sh	Eg.
	3	31		II.	Sh	In.
	3	57		I.	Tr	Eg.
	5	15		II.	Tr	In.
	6	27		II.	Sh	Eg.
	8	11		II.	Tr	Eg.
	22	03	13.8	I.	Ec	Dis.
29	1	13		I.	Oc	Re.
	19	13		I.	Sh	In.
	20	03		I.	Tr	In.
	21	33		I.	Sh	Eg.
	22	00	47.7	II.	Ec	Dis.
	22	24		I.	Tr	Eg.
30	2	33		II.	Oc	Re.
	4	08	25.6	III.	Ec	Dis.
	11	09		III.*	Oc	Re
	16	31	44.1	I.	Ec	Dis.
	19	40		I.	Oc	Re

WASHINGTON MEAN TIME.

JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.	d * ◯	III.	d * r * ◯
II.	d * ◯	IV.	d * r * ◯

Configurations at 13ʰ 30ᵐ for an Inverting Telescope.

Day.	West.	East.
1	◯1· 4·	◯ ·3● ·2●
2	4·	◯ ·1 ·3·
3	·4	1· 2· ◯ ·3
4	·4 ·2	◯ ·1 3·
5	·4 1· 3·	◯ ·2
6	3· ·4	◯ 1··
7	·3 2· ·1	◯ ·4
8	·3 ·2	◯1· ·4
9		◯ ·3 ·2 ·4 ·1●
10	◯2· 1·	◯ ·3 ·4
11	·2	◯ ·1 3· 4·
12	◯3· 1·	◯ ·2 4·
13	3·	◯ 1· 2· 4·
14	·3 2· ·1	◯ 4·
15	◯4· ·3 ·2	◯ 1·
16	4·	◯ ·3 ·2 ·1●
17	4·	1·◯2· ·3
18	4· ·2	◯ ·1 3·
19	4· 1·	◯3· ·2
20	·4 3·	◯ ·1 2·
21	·4 ·3 ·1·	◯
22	·4 ·3 ·2	◯ 1·
23	·4 1· ◯ ·3 ·2	
24	◯1·	◯ 2· ·4 ·3
25	2·	◯ ·1 3· ·4
26	1·	◯ ·23· ·4
27	3·	◯ ·1 2· ·4
28	3· ·12·	◯ 4·
29	·3 ·2	◯ 1· 4·
30	·1	◯ ·3 ·2 4·

WASHINGTON MEAN TIME.

JUNE.

d	h	m	s	Sat	Phen	Pos
1	11	39		I.	Sh.	In.
	11	44	50.5	II.	Ec.	Dis.
	12	10	43.9	III.*	Ec.	Dis.
	12.	53		I.*	Tr.	In.
	13	59		I.*	Sh.	Eg.
	15	13		I.*	Tr.	Eg.
	15	41	20.9	III.*	Ec.	Re.
	17	05		II.	Oc.	Re.
	17	06		III.	Oc.	Dis.
	20	49		III.	Oc.	Re.
2	8	55	05.0	I.	Ec.	Dis.
	12	27		I.*	Oc.	Re.
3	6	07		I.	Sh.	In.
	6	21		II.	Sh.	In.
	7	20		I.	Tr.	In.
	8	27		I.	Sh.	Eg.
	8	46		II.	Tr.	In.
	9	18		II.	Sh.	Eg.
	9	41		I.	Tr.	Eg.
	11	42		II.	Tr.	Eg.
4	3	23	39.0	I.	Ec.	Dis.
	6	55		I.	Oc.	Re.
5	0	35		I.	Sh.	In.
	1	01	45.6	II.	Ec.	Dis.
	1	48		I.	Tr.	In.
	1	59		III.	Sh.	In.
	2	55		I.	Sh.	Eg.
	4	08		I.	Tr.	Eg.
	5	39		III.	Sh.	Eg.
	6	18		II.	Oc.	Re.
	6	50		III.	Tr.	In.
	10	33		III.	Tr.	Eg.
	21	52	07.5	I.	Ec.	Dis.
6	1	22		I.	Oc.	Re.
	14	17	58.7	IV.*	Ec.	Dis.
	18	50	46.1	IV.	Ec.	Re.
	19	04		I.	Sh.	In.
	19	40		II.	Sh.	In.
	20	15		I.	Tr.	In.
	21	24		I.	Sh.	Eg.
	22	00		II.	Tr.	In.
	22	35		I.	Tr.	Eg.
	22	36		II.	Sh.	Eg.
7	0	57		II.	Tr.	Eg.
	1	12		IV.	Oc.	Dis.
	6	06		IV.	Oc.	Re.
	16	20	42.1	I.	Ec.	Dis.
	19	50		I.	Oc.	Re.
8	13	32		I.*	Sh.	In.
	14	18	41.5	II.*	Ec.	Dis.
	14	42		I.*	Tr.	In.
	15	52		I.*	Sh.	Eg.
	16	10	11.1	III.*	Ec.	Dis.
	17	03		I.	Tr.	Eg.
	19	30		II.	Oc.	Re.
	19	41	08.3	III.	Ec.	Re.
	20	48		III.	Oc.	Dis.
9	0	31		III.	Oc.	Re.
	10	49	09.0	I.	Ec.	Dis.
	14	17		I.*	Oc.	Re.
10	8	00		I.	Sh.	In.
	8	58		II.	Sh.	In.
	9	09		I.	Tr.	In.
	10	20		I.	Sh.	Eg.
	11	14		II.	Tr.	In.
	11	30		I.*	Tr.	Eg.

d	h	m	s	Sat	Phen	Pos
10	11	55		II.*	Sh.	Eg.
	14	10		II.*	Tr.	Eg.
11	5	17	43.7	I.	Ec.	Dis.
	8	44		I.	Oc.	Re.
12	2	29		I.	Sh.	In.
	3	35	38.6	II.	Ec.	Dis.
	3	36		I.	Tr.	In.
	4	49		I.	Sh.	Eg.
	5	57		I.	Tr.	Eg.
	5	58		III.	Sh.	In.
	8	42		II.	Oc.	Re.
	9	39		III.	Sh.	Eg.
	10	29		III.	Tr.	In.
	14	12		III.*	Tr.	Eg.
	23	46	13.0	I.	Ec.	Dis.
13	3	12		I.	Oc.	Re.
	20	57		I.	Sh.	In.
	22	03		I.	Tr.	In.
	22	17		II.	Sh.	In.
	23	17		I.	Sh.	Eg.
14	0	24		I.	Tr.	Eg.
	0	27		II.	Tr.	In.
	1	13		II.	Sh.	Eg.
	3	23		II.	Tr.	Eg.
	18	14	48.5	I.	Ec.	Dis.
	21	39		I.	Oc.	Re.
	23	54		IV.	Sh.	In.
15	4	37		IV.	Sh.	Eg.
	9	48		IV.	Tr.	In.
	14	42		IV.*	Tr.	Eg.
	15	25		I.*	Sh.	In.
	16	30		I.	Tr.	In.
	16	52	36.9	II.	Ec.	Dis.
	17	45		I.	Sh.	Eg.
	18	51		I.	Tr.	Eg.
	20	09	39.6	III.	Ec.	Dis.
	21	53		II.	Oc.	Re.
	23	40	55.8	III.	Ec.	Re.
16	0	25		III.	Oc.	Dis.
	4	08		III.	Oc.	Re.
	12	43	16.2	I.*	Ec.	Dis.
	16	06		I.*	Oc.	Re.
17	9	54		I.	Sh.	In.
	10	57		I.*	Tr.	In.
	11	35		II.*	Sh.	In.
	12	14		I.*	Sh.	Eg.
	13	17		I.*	Tr.	Eg.
	13	40		II.*	Tr.	In.
	14	32		II.*	Sh.	Eg.
	16	36		II.	Tr.	Eg.
18	7	11	51.7	I.	Ec.	Dis.
	10	32		I.	Oc.	Re.
19	4	22		I.	Sh.	In.
	5	24		I.	Tr.	In.
	6	09	36.7	II.	Ec.	Dis.
	6	42		I.	Sh.	Eg.
	7	44		I.	Tr.	Eg.
	9	58		III.	Sh.	In.
	11	04		II.*	Oc.	Re.
	13	38		III.*	Sh.	Eg.
	14	04		III.*	Tr.	In.
	17	47		III.	Tr.	Eg.
20	1	40	22.2	I.	Ec.	Dis.
	4	59		I.	Oc.	Re.
	22	51		I.	Sh.	In.
	23	50		I.	Tr.	In.

d	h	m	s	Sat	Phen	Pos
21	0	54		II.	Sh.	In.
	1	11		I.	Sh.	Eg.
	2	11		I.	Tr.	Eg.
	2	52		II.	Tr.	In
	3	50		II.	Sh.	Eg.
	5	48		II.	Tr.	Eg.
	20	08	58.8	I.	Ec.	Dis.
	23	26		I.	Oc.	Re.
22	17	19		I.	Sh.	In.
	18	17		I.	Tr.	In.
	19	26	38.4	II.	Ec.	Dis.
	19	39		I.	Sh.	Eg.
	20	37		I.	Tr.	Eg.
23	0	08	57.8	III.	Ec.	Dis.
	0	14		II.	Oc.	Re.
	3	40	31.4	III.	Ec.	Re.
	3	57		III.	Oc.	Dis.
	7	40		III.	Oc.	Re.
	8	23	09.9	IV.	Ec.	Dis.
	12	58	31.1	IV.*	Ec.	Re.
	14	37	28.0	I.*	Ec.	Dis.
	17	07		IV.	Oc.	Dis.
	17	53		I.	Oc.	Re.
	22	02		IV.	Oc.	Re.
24	11	47		I.*	Sh.	In.
	12	44		I.*	Tr.	In.
	14	07		I.*	Sh.	Eg.
	14	12		II.*	Sh.	In.
	15	04		I.*	Tr.	Eg.
	16	04		II.*	Tr.	In.
	17	09		II.	Sh.	Eg.
	19	00		II.	Tr.	Eg.
25	9	06	04.4	I.	Ec.	Dis.
	12	20		I.*	Oc.	Re.
26	6	16		I.	Sh.	In.
	7	10		I.	Tr.	In.
	8	36		I.	Sh.	Eg.
	8	43	41.9	II.	Ec.	Dis.
	9	31		I.	Tr.	Eg.
	13	24		II.*	Oc.	Re.
	13	57		III.*	Sh.	In.
	17	35		III.	Tr.	In.
	17	38		III.	Sh.	Eg.
	21	18		III.	Tr.	Eg.
27	3	34	36.0	I.	Ec.	Dis.
	6	47		I.	Oc.	Re.
28	0	44		I.	Sh.	In.
	1	37		I.	Tr.	In.
	3	04		I.	Sh.	Eg.
	3	31		II.	Sh.	In.
	3	57		I.	Tr.	Eg.
	5	15		II.	Tr.	In.
	6	27		II.	Sh.	Eg.
	8	11		II.	Tr.	Eg.
	22	03	13.8	I.	Ec.	Dis.
29	1	13		I.	Oc.	Re.
	19	13		I.	Sh.	In.
	20	03		I.	Tr.	In.
	21	33		I.	Sh.	Eg.
	22	00	47.7	II.	Ec.	Dis.
	22	24		I.	Tr.	Eg.
30	2	33		II.	Oc.	Re.
	4	08	25.6	III.	Ec.	Dis.
	11	09		III.*	Oc.	Re.
	16	31	44.1	I.	Ec.	Dis.
	19	40		I.	Oc.	Re.

Note.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.	d *	◯	III.	d *	r *	◯
II.	d *	◯	IV.	d *	r *	◯

Configurations at 13ʰ 30ᵐ for an Inverting Telescope.

Day.	West.		East.
1	◯ 1·　　4·	◯	·3● ·2●
2	4·	◯ ·1　　·3 ·	
3	·4	1· 2· ◯	·3
4	·4	·2　　◯ ·1　3·	
5	·4　　1· 3·	◯ ·2	
6	3·　　·4	◯ ·2·	
7	·3　　2·　·1	◯ ·4	
8	·3 ·2	◯ 1·	·4
9		◯ ·3 ·2	·4　　·1●
10	◯ 2·	1· ◯	·3　·4
11	·2	◯ ·1　3·	4·
12	◯ 3·	1· ◯ ·2	4·
13	3·	◯ 1· 2·	4·
14	·3　2· ·1	◯ 4·	
15	◯ 4·	·3 ·2 ◯ 1·	
16	4·	◯ ·3 ·2	·1●
17	4·	1· ◯ 2·	·3
18	4·	·2 ◯ ·1　3·	
19	4·	1· ◯ 3· ·2	
20	·4	3· ◯ ·1 2·	
21	·4　·3	·1· ◯	
22	·4　·3 ·2	◯ 1·	
23	·4 ◯ ·3 ·2		
24	◯ 1·	◯ 2· ·4 ·3	
25	2·	◯ ·1　3· ·4	
26	1·	◯ ·2 3·	·4
27	3·	◯ 1 2·	·4
28	3· ·1 2·	◯	4·
29	·3 ·2	◯ 1·	4·
30	·1 ◯ ·3　·2	4·	

WASHINGTON MEAN TIME.

JULY.

d	h	m	s	Sat.	Ph.	Pos.
1	13	41		I.*	Sh.	In.
	14	30		I.*	Tr.	In.
	16	01		I.*	Sh.	Eg.
	16	50		I.	Tr.	Eg.
	16	50		II.	Sh.	In.
	18	02		IV.	Sh.	In.
	18	25		II.	Tr.	In.
	19	46		II.	Sh.	Eg.
	21	21		II.	Tr.	Eg.
	22	48		IV.	Sh.	Eg.
2	1	19		IV.	Tr.	In.
	6	14		IV.	Tr.	In.
	11	00	21.8	I.*	Ec.	Dis.
	14	06		I.*	Oc.	Re.
3	8	09		I.	Sh.	In.
	8	56		I.	Tr.	In.
	10	29		I.*	Sh.	Eg.
	11	16		I.*	Tr.	Eg.
	11	17	56.0	II.*	Ec.	Dis.
	15	42		II.*	Oc.	Re.
	17	57		III.	Sh.	In.
	21	01		III.	Tr.	In.
	21	38		III.	Sh.	Eg.
4	0	44		III.	Tr.	Eg.
	5	28	55.0	I.	Ec.	Dis.
	8	33		I.	Oc.	Re.
5	2	38		I.	Sh.	In.
	3	22		I.	Tr.	In.
	4	58		I.	Sh.	Eg.
	5	42		I.	Tr.	Eg.
	6	08		II.	Sh.	In.
	7	35		II.	Tr.	In.
	9	04		II.	Sh.	Eg.
	10	31		II.*	Tr.	Eg.
	23	57	34.0	I.	Ec.	Dis.
6	2	59		I.	Oc.	Re.
	21	06		I.	Sh.	In.
	21	49		I.	Tr.	In.
	23	26		I.	Sh.	Eg.
7	0	09		I.	Tr.	Eg.
	0	35	06.7	II.	Ec.	Dis.
	4	51		II.	Oc.	Re.
	8	08	28.3	III.	Ec.	Dis.
	14	34		III.*	Oc.	Re.
	18	26	05.5	I.	Ec.	Dis.
	21	25		I.	Oc.	Re.
8	15	35		I.*	Sh.	In.
	16	15		I.*	Tr.	In.
	17	55		I.	Sh.	Eg.
	18	35		I.	Tr.	Eg.
	19	27		II.	Sh.	In.
	20	45		II.	Tr.	In.
	22	23		II.	Sh.	Eg.
	23	41		II.	Tr.	Eg.
9	12	54	44.5	I.*	Ec.	Dis.
	15	52		I.*	Oc.	Re.
10	2	28	53.4	IV.	Ec.	Dis.
	7	06	30.2	IV.	Ec.	Re.
	8	10		IV.	Oc.	Dis.
	10	03		I.*	Sh.	In.
	10	41		I.*	Tr.	In.
	12	23		I.*	Sh.	Eg.
	13	01		I.*	Tr.	Eg.
	13	06		IV.*	Oc.	Re.
	13	52	20.1	II.*	Ec.	Dis.
	17	59		II.	Oc.	Re.
10	21	56		III.	Sh.	In.
11	0	24		III.	Tr.	In.
	1	38		III.	Sh.	Eg.
	4	07		III.	Tr.	Eg.
	7	23	18.8	I.	Ec.	Dis.
	10	18		I.*	Oc.	Re.
12	4	32		I.	Sh.	In.
	5	07		I.	Tr.	In.
	6	52		I.	Sh.	Eg.
	7	27		I.	Tr.	Eg.
	8	45		II.	Sh.	In.
	9	54		II.*	Tr.	In.
	11	42		II.*	Sh.	Eg.
	12	50		II.*	Tr.	Eg.
13	1	51	59.2	I.	Ec.	Dis.
	4	44		I.	Oc.	Re.
	23	00		I.	Sh.	In.
	23	33		I.	Tr.	In.
14	1	20		I.	Sh.	Eg.
	1	53		I.	Tr.	Eg.
	3	09	36.4	II.	Ec.	Dis.
	7	07		II.	Oc.	Re.
	12	08	29.8	III.*	Ec.	Dis.
	17	55		III.	Oc.	Re.
	20	20	32.4	I.	Ec.	Dis.
	23	10		I.	Oc.	Re.
15	17	29		I.	Sh.	In.
	17	59		I.	Tr.	In.
	19	49		I.	Sh.	Eg.
	20	19		I	Tr.	Eg.
	22	04		II.	Sh.	In.
	23	03		II.	Tr.	In.
16	1	00		II.	Sh.	Eg.
	1	59		II.	Tr.	Eg.
	14	49	12.6	I.*	Ec.	Dis.
	17	36		I.	Oc.	Re.
17	11	57		I.*	Sh.	In.
	12	25		I.*	Tr.	In.
	14	17		I.*	Sh.	Eg.
	14	45		I.*	Tr.	Eg.
	16	26	55.6	II.	Ec.	Dis.
	20	14		II.	Oc.	Re.
18	1	56		III.	Sh.	In.
	3	43		III.	Tr.	In.
	5	38		III.	Sh.	Eg.
	7	26		III.	Tr.	Eg.
	9	17	48.3	I.*	Ec.	Dis.
	12	02		I.*	Oc.	Re.
	12	10		IV.*	Sh.	In.
	16	06		IV.*	Tr.	In.
	16	59		IV.	Sh.	Eg.
	21	02		IV.	Tr.	Eg.
19	6	26		I.	Sh.	In.
	6	51		I.	Tr.	In.
	8	46		I.	Sh.	Eg.
	9	11		I.*	Tr.	Eg.
	11	22		II.*	Sh.	In.
	12	12		II.*	Tr.	In.
	14	19		II.*	Sh.	Eg.
	15	08		II.*	Tr.	Eg.
20	3	46	30.2	I.	Ec.	Dis.
	6	29		I.	Oc.	Re.
21	0	54		I.	Sh.	In.
	1	17		I.	Tr.	In.
	3	14		I.	Sh.	Eg.
	3	37		I.	Tr.	Eg.
21	5	44	18.2	II.	Ec.	Dis.
	9	22		II.	Oc.	Re.
	16	09	11.4	III.*	Ec.	Dis.
	21	14		III.	Oc.	Re.
	22	15	05.0	I.	Ec.	Dis.
22	0	55		I.	Oc.	Re.
	19	23		I.	Sh.	In.
	19	43		I.	Tr.	In.
	21	43		I.	Sh.	Eg.
	22	03		I.	Tr.	Eg.
23	0	41		II.	Sh.	In.
	1	20		II.	Tr.	In.
	3	37		II.	Sh.	Eg.
	4	16		II.	Tr.	Eg.
	16	43	46.5	I.	Ec.	Dis.
	19	21		I.	Oc.	Re.
24	13	51		I.*	Sh.	In.
	14	09		I.*	Tr.	In.
	16	11		I.*	Sh.	Eg.
	16	29		I.*	Tr.	Eg.
	19	01	44.0	II.	Ec.	Dis.
	22	29		II.	Oc.	Re.
25	5	56		III.	Sh.	In.
	7	01		III.	Tr.	In.
	9	38		III.*	Sh.	Eg.
	10	44		III.*	Tr.	Eg.
	11	12	23.8	I.*	Ec.	Dis.
	13	47		I.*	Oc.	Re.
26	8	20		I.	Sh.	In.
	8	34		I.*	Tr.	In.
	10	40		I.*	Sh.	Eg.
	10	54		I.*	Tr.	Eg.
	13	59		II.*	Sh.	In.
	14	28		II.*	Tr.	In.
	16	56		II.	Sh.	Eg.
	17	24		II.	Tr.	Eg.
	20	35	28.0	IV.	Ec.	Dis.
27	3	31		IV.	Oc.	Re.
	5	41	07.2	I.	Ec.	Dis.
	8	13		I.	Oc.	Re.
28	2	48		I.	Sh.	In.
	3	01		I.	Tr.	In.
	5	08		I.	Sh.	Eg.
	5	21		I.	Tr.	Eg.
	8	19	13.3	II.*	Ec.	Dis.
	11	36		II.*	Oc.	Re.
	20	09	22.9	III.	Ec.	Dis.
29	0	09	43.8	I.	Ec.	Dis.
	0	31		III.	Oc.	Re.
	2	40		I.	Oc.	Re.
	21	17		I.	Sh.	In.
	21	26		I.	Tr.	In.
	23	37		I.	Sh.	Eg.
	23	46		I.	Tr.	Eg.
30	3	18		II.	Sh.	In.
	3	36		II.	Tr.	In.
	6	14		II.	Sh.	Eg.
	6	32		II.	Tr.	Eg.
	18	38	26.8	I.	Ec.	Dis.
	21	05		I.	Oc.	Re.
31	15	46		I.*	Sh.	In.
	15	52		I.*	Tr.	In.
	18	06		I.	Sh.	Eg.
	18	12		I.	Tr.	Eg.
	21	36	46.1	II.	Ec.	Dis.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.   d *   ⬭

III.   d *   ⬭

II.   d *   ⬭

IV.   d *   r *   ⬭

Configurations at 12ʰ 30ᵐ *for an Inverting Telescope.*

Day.	West.		East.
1		O	1· 2·4· ·3
2	2· 4·	O	3· ·1●
3	4· 1·	O	3· ·2●
4	4· 3·	O	·1 2·
5	4· · 3· 1· 2·	O	
6	··4 ·3 ·2	O	1·
7	·4 ·1	O	·2 ·3●
8	·4	O	1· 2· ·3
9	·⁴ₛ ·1	O	3·
10	O1· ·2	O	3· ·⁴●
11	3·	O	·1 ·⁴·₂
12	O2· 3· 1·	O	·4
13	·3 ·2	O	·1 ·4 ·
14	·1	O	·2 ·4 ·3●
15		O	1· 2· ·3 4·
16	2· ·1	O	3· 4·
17	O1· ·2	O	3· 4·
18	3·	O	·¹₄ ·2
19	O2· 3· 4· 1·	O	
20	4· ·3 ·2	O	·1
21	4· 1· ·3	O	·2
22	4·	O	1· 2· ·3
23	·4 2· ·1	O	·3
24	·4 ·2	O	1· 3·
25	·4 3·	O	·2 ·1●
26	3· ·4 1·	O 2·	
27	·3 2·	O	·⁴ ·₁
28	·³ 1·	O	·2 ·4
29		O	1· ·³₂ ·4
30	·¹ₛ	O	·3 ·4
31	·2	O	1· · 3· 4·

WASHINGTON MEAN TIME.

AUGUST.

d	h	m	s			
1	0	42		II.	Oc.	Re.
	9	56		III.*	Sh.	In.
	10	17		III.*	Tr.	In.
	13	07	05.4	I.*	Ec.	Dis.
	13	38		III.*	Sh.	Eg.
	14	00		III.*	Tr.	Eg.
	15	30		I.*	Oc.	Re.
2	10	14		I.*	Sh.	In.
	10	18		I.*	Tr.	In.
	12	34		I.*	Sh.	Eg.
	12	38		I.*	Tr.	Eg.
	16	37		II.	Sh.	In.
	16	44		II.	Tr.	In.
	19	33		II.	Sh.	Eg.
	19	40		II.	Tr.	Eg.
3	7	35	50.3	I.	Ec.	Dis.
	9	56		I.*	Oc.	Re.
4	4	43		I.	Sh.	In.
	4	44		I.	Tr.	In.
	6	20		IV.	Sh.	In.
	6	27		IV.	Tr.	In.
	7	03		I.	Sh.	Eg.
	7	04		I.	Tr.	Eg.
	10	53		II.*	Oc.	Dis.
	11	11		IV.*	Sh.	Eg.
	11	22		IV.*	Tr.	Eg.
	13	49		II.*	Oc.	Re.
5	0	04		III.	Oc.	Dis.
	2	02		I.	Oc.	Dis.
	3	47		III.	Oc.	Re.
	4	22		I.	Oc.	Re.
	23	10		I.	Tr.	In.
	23	11		I.	Sh.	In.
6	1	30		I.	Tr.	Eg.
	1	32		I.	Sh.	Eg.
	5	51		II.	Tr.	In.
	5	55		II.	Sh.	In.
	8	47		II.*	Tr.	Eg.
	8	51		II.*	Sh.	Eg.
	20	28		I.	Oc.	Dis.
	22	49	12.1	I.	Ec.	Re.
7	17	36		I.	Tr.	In.
	17	40		I.	Sh.	In.
	19	56		I.	Tr.	Eg.
	20	01		I.	Sh.	Eg.
8	0	00		II.	Oc.	Dis.
	3	02	33.4	II.	Ec.	Re.
	13	34		III.*	Tr.	In.
	13	56		III.*	Sh.	In.
	14	54		I.*	Oc.	Dis.
	17	16		III.	Tr.	Eg.
	17	17	51.8	I.	Ec.	Re.
	17	38		III.	Sh.	Eg.
9	12	02		I.*	Tr.	In.
	12	09		I.*	Sh.	In.
	14	22		I.*	Tr.	Eg.
	14	29		I.*	Sh.	Eg.
	18	59		II.	Tr.	In.
	19	14		II.	Sh.	In.
	21	55		II.	Tr.	Eg.
	22	10		II.	Sh.	Eg.
10	9	20		I.*	Oc.	Dis.
	11	46	37.6	I.*	Ec.	Re.
11	6	27		I.	Tr.	In.
	6	37		I.	Sh.	In.
	8	47		I.	Tr.	Eg.
	8	58		I.*	Sh.	Eg.
11	13	07		II.*	Oc.	Dis.
	16	20	20.0	II.*	Ec.	Re.
12	3	20		III.	Oc.	Dis.
	3	46		I.	Oc.	Dis.
	6	15	16.7	I.	Ec.	Re.
	7	42	45.3	III.	Ec.	Re.
	12	47		IV.*	Oc.	Dis.
	19	24	33.2	IV.	Ec.	Re.
13	0	53		I.	Tr.	In.
	1	06		I.	Sh.	In.
	3	14		I.	Tr.	Eg.
	3	26		I.	Sh.	Eg.
	8	07		II.*	Tr.	In.
	8	32		II.*	Sh.	In.
	11	03		II.*	Tr.	Eg.
	11	28		II.*	Sh.	Eg.
	22	12		I.	Oc.	Dis.
14	0	44	01.8	I.	Ec.	Re.
	19	19		I.	Tr.	In.
	19	34		I.	Sh.	In.
	21	40		I.	Tr.	Eg.
	21	54		I.	Sh.	Eg.
15	2	14		II.	Oc.	Dis.
	5	38	10.4	II.	Ec.	Re.
	16	38		I.	Oc.	Dis.
	16	51		III.	Tr.	In.
	17	56		III.	Sh.	In.
	19	12	43.1	I.	Ec.	Re.
	20	34		III.	Tr.	Eg.
	21	38		III.	Sh.	Eg.
16	13	45		I.*	Tr.	In.
	14	03		I.*	Sh.	In.
	16	06		I.	Tr.	Eg.
	16	24		I.	Sh.	Eg.
	21	14		II.	Tr.	In.
	21	51		II.	Sh.	In.
17	0	11		II.	Tr.	Eg.
	0	47		II.	Sh.	Eg.
	11	04		I.*	Oc.	Dis.
	13	41	30.4	I.*	Ec.	Re.
18	8	11		I.*	Tr.	In.
	8	32		I.*	Sh.	In.
	10	32		I.*	Tr.	Eg.
	10	52		I.*	Sh.	Eg.
	15	21		II.	Oc.	Dis.
	18	56	04.8	II.	Ec.	Re.
19	5	30		I.	Oc.	Dis.
	6	37		III.	Oc.	Dis.
	8	10	11.0	I.	Ec.	Re.
	11	43	12.9	III.*	Ec.	Re.
20	2	38		I.	Tr.	In.
	3	00		I.	Sh.	In.
	4	58		I.	Tr.	Eg.
	5	21		I.	Sh.	Eg.
	10	22		II.*	Tr.	In.
	11	09		II.*	Sh.	In.
	13	19		II.*	Tr.	Eg.
	14	05		II.*	Sh.	Eg.
	20	47		IV.	Tr.	In.
	23	56		I.	Oc.	Dis.
21	0	30		IV.	Sh.	In.
	1	42		IV.	Tr.	Eg.
	2	38	57.2	I.	Ec.	Re.
	5	23		IV.	Sh.	Eg.
	21	04		I.	Tr.	In.
	21	29		I.	Sh.	In.
	23	24		I.	Tr.	Eg.
21	23	50		I.	Sh.	Eg.
22	4	29		II.	Oc.	Dis.
	8	14	03.2	II.*	Ec.	Re.
	18	23		I.	Oc.	Dis.
	20	09		III.	Tr.	In.
	21	07	39.8	I.	Ec.	Re.
	21	57		III.	Sh.	In.
	23	52		III.	Tr.	Eg.
23	1	39		III.	Sh.	Eg.
	15	30		I.	Tr.	In.
	15	58		I.	Sh.	In.
	17	50		I.	Tr.	Eg.
	18	19		I.	Sh.	Eg.
	23	31		II.	Tr.	In.
24	0	28		II.	Sh.	In.
	2	27		II.	Tr.	Eg.
	3	24		II.	Sh.	Eg.
	12	49		I.*	Oc.	Dis.
	15	36	28.3	I.	Ec.	Re.
25	9	56		I.*	Tr.	In.
	10	27		I.*	Sh.	In.
	12	17		I.*	Tr.	Eg.
	12	47		I.*	Sh.	Eg.
	17	36		II.	Oc.	Dis.
	21	32	05.6	II.	Ec.	Re.
26	7	15		I.	Oc.	Dis.
	9	56		III.*	Oc.	Dis.
	10	05	10.4	I.*	Ec.	Re.
	15	44	17.1	III.	Ec.	Re.
27	4	22		I.	Tr.	In.
	4	55		I.	Sh.	In.
	6	43		I.	Tr.	Eg.
	7	16		I.	Sh.	Eg.
	12	39		II.*	Tr.	In.
	13	46		II.*	Sh.	In.
	15	35		II.	Tr.	Eg.
	16	42		II.	Sh.	Eg.
28	1	41		I.	Oc.	Dis.
	4	33	57.8	I.	Ec.	Re.
	22	49		I.	Tr.	In.
	23	24		I.	Sh.	In.
29	1	09		I.	Tr.	Eg.
	1	45		I.	Sh.	Eg.
	3	12		IV.	Oc.	Dis.
	6	45		II.	Oc.	Dis.
	8	06		IV.*	Oc.	Re.
	8	52	18.8	IV.*	Ec.	Dis.
	10	50	11.8	II.*	Ec.	Re.
	13	34	29.0	IV.*	Ec.	Re.
	20	08		I.	Oc.	Dis.
	23	02	41.6	I.	Ec.	Re.
	23	29		III.	Tr.	In.
30	1	58		III.	Sh.	In.
	3	12		III.	Tr.	Eg.
	5	41		III.	Sh.	Eg.
	17	14		I.	Tr.	In.
	17	53		I.	Sh.	In.
	19	35		I.	Tr.	Eg.
	20	13		I.	Sh.	Eg.
31	1	48		II.	Tr.	In.
	3	05		II.	Sh.	In.
	4	44		II.	Tr.	Eg.
	6	01		II.	Sh.	Eg.
	14	34		I.*	Oc.	Dis.
	17	31	31.2	I.	Ec.	Re.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.   III.

II.   IV.

Configurations at $11^h\ 00^m$ for an Inverting Telescope.

Day.	West.	East.
1	○3· ·1	○ ·2 4·
2	○1· 3·	○ 2· 4·
3	·3 2·	○ ·1 4·
4	·3 1· 4·	○ ·2●
5	4·	○ ·3·1 2·
6	4· 1· 2·	○ ·3
7	4· ·2	○ 1· 3·
8	4· ·1	○ 3· ·2
9	·4 3·	○ 1· 2·
10	·4 ·3 2·	○ ·1●
11	·4 ·3 1·²·	○
12	·4○ ·3 ·1 ·2	
13	1· 2· ○ ·4 ·3	
14	·2	○ 1· 3· ·4
15	·1	○ ²·¹· ·4
16	3·	○ 1· 2· ·4
17	3· 2· ·1○	4·
18	·3 ·2 1· ○	4·
19		○ ·1 ·2 4· ·3●
20	○2· 1·	○ 4· ·3
21	·2 4·	○ ·1 3·
22	4· ·1	○ ·2 3·
23	4· 3·	○ 1· 2·
24	4· 3· 2· ·1	○
25	○1· ·4 ·3 ·2	○
26	·4	○ ·1 ·2 ·3●
27	·4 1·	○2· ·3
28	·2 ·4	○ ·1 3·
29	·1	○ ·2 3· ·4●
30	3·	○ 1· 2· ·4
31	3· 2· ·1	○ ·4

WASHINGTON MEAN TIME.

SEPTEMBER.

d	h	m	s			
1	11	42		I.*	Tr.	In.
	12	22		I.*	Sh.	In.
	14	02		I.*	Tr.	Eg.
	14	42		I.	Sh.	Eg.
	19	54		II.	Oc.	Dis.
2	0	08	21.8	II.	Ec.	Re.
	9	01		I.*	Oc.	Dis.
	12	00	14.5	I.*	Ec.	Re.
	13	19		III.*	Oc.	Dis.
	19	45	16.7	III.	Ec.	Re.
3	6	08		I.	Tr.	In.
	6	50		I.	Sh.	In.
	8	28		I.*	Tr.	Eg.
	9	11		I.*	Sh.	Eg.
	14	57		II.	Tr.	In.
	16	23		II.	Sh.	In.
	17	53		II.	Tr.	Eg.
	19	19		II.	Sh.	Eg.
4	3	27		I.	Oc.	Dis.
	6	29	03.0	I.	Ec.	Re.
5	0	35		I.	Tr.	In.
	1	19		I.	Sh.	In.
	2	55		I.	Tr.	Eg.
	3	40		I.	Sh.	Eg.
	9	03		II.*	Oc.	Dis.
	13	26	35.7	II.*	Ec.	Re.
	21	54		I.	Oc.	Dis.
6	0	57	47.6	I.	Ec.	Re.
	2	52		III.	Tr.	In.
	5	59		III.	Sh.	In.
	6	35		III.	Tr.	Eg.
	9	42		III.*	Sh.	Eg.
	11	34		IV.*	Tr.	In.
	16	28		IV.	Tr.	Eg.
	18	42		IV.	Sh.	In.
	19	01		I.	Tr.	In.
	19	48		I.	Sh.	In.
	21	22		I.	Tr.	Eg.
	22	08		I.	Sh.	Eg.
	23	36		IV.	Sh.	Eg.
7	4	07		II.	Tr.	In.
	5	42		II.	Sh.	In.
	7	03		II.*	Tr.	Eg.
	8	38		II.*	Sh.	Eg.
	16	21		I.	Oc.	Dis.
	19	26	38.7	I.	Ec.	Re.
8	13	28		I.*	Tr.	In.
	14	17		I.	Sh.	In.
	15	49		I.	Tr.	Eg.
	16	37		I.	Sh.	Eg.
	22	12		II.	Oc.	Dis.
9	2	44	53.3	II.	Ec.	Re.
	10	47		I.*	Oc.	Dis.
	13	55	23.4	I.*	Ec.	Re.
	16	44		III.	Oc.	Dis.
	23	46	54.8	III.	Ec.	Re.
10	7	55		I.*	Tr.	In.
	8	45		I.*	Sh.	In.
	10	15		I.*	Tr.	Eg.
	11	06		I.*	Sh.	Eg.
	17	17		II.	Tr.	In.
	19	00		II.	Sh.	In.
	20	13		II.	Tr.	Eg.
	21	56		II.	Sh.	Eg.

d	h	m	s			
11	5	14		I.	Oc.	Dis.
	8	24	12.7	I.*	Ec.	Re.
12	2	21		I.	Tr.	In.
	3	14		I.	Sh.	In.
	4	42		I.	Tr.	Eg.
	5	35		I.	Sh.	Eg.
	11	22		II.*	Oc.	Dis.
	16	03	14.9	II.	Ec.	Re.
	23	41		I.	Oc.	Dis.
13	2	52	58.8	I.	Ec.	Re.
	6	20		III.	Tr.	In.
	9	59		III.*	Sh.	In.
	10	02		III.*	Tr.	Eg.
	13	42		III.	Sh.	Eg.
	20	48		I.	Tr.	In.
	21	43		I.	Sh.	In.
	23	09		I.	Tr.	Eg.
14	0	03		I.	Sh.	Eg.
	6	27		II.	Tr.	In.
	8	19		II.*	Sh.	In.
	9	24		II.*	Tr.	Eg.
	11	15		II.*	Sh.	Eg.
	18	08		I.	Oc.	Dis.
	18	14		IV.	Oc.	Dis.
	21	21	48.3	I.	Ec.	Re.
	23	07		IV.	Oc.	Re.
15	3	02	02.4	IV.	Ec.	Dis.
	7	45	00.8	IV.*	Ec.	Re.
	15	15		I.	Tr.	In.
	16	12		I.	Sh.	In.
	17	36		I.	Tr.	Eg.
	18	32		I.	Sh.	Eg.
16	0	33		II.	Oc.	Dis.
	5	21	39.9	II.	Ec.	Re.
	12	35		I.*	Oc.	Dis.
	15	50	36.2	I.	Ec.	Re.
	20	13		III.	Oc.	Dis.
	23	57		III.	Oc.	Re.
17	0	14	40.2	III.	Ec.	Dis.
	3	47	58.6	III.	Ec.	Re.
	9	42		I.*	Tr.	In.
	10	41		I.*	Sh.	In.
	12	03		I.*	Tr.	Eg.
	13	01		I.*	Sh.	Eg.
	19	38		II.	Tr.	In.
	21	37		II.	Sh.	In.
	22	35		II.	Tr.	Eg.
18	0	33		II.	Sh.	Eg.
	7	02		I.	Oc.	Dis.
	10	19	26.1	I.*	Ec.	Re.
19	4	09		I.	Tr.	In.
	5	09		I.	Sh.	In.
	6	30		I.	Tr.	Eg.
	7	30		I.*	Sh.	Eg.
	13	44		II.	Oc.	Dis.
	18	40	08.5	II.	Ec.	Re.
20	1	29		I.	Oc.	Dis.
	4	48	13.1	I.	Ec.	Re.
	9	52		III.*	Tr.	In.
	13	36		III.	Tr.	Eg.
	14	01		III.	Sh.	In.
	17	44		III.	Sh.	Eg.
	22	36		I.	Tr.	In.
	23	38		I.	Sh.	In.

d	h	m	s			
21	0	57		I.	Tr.	Eg.
	1	59		I.	Sh.	Eg.
	8	50		II.*	Tr.	In.
	10	56		II.*	Sh.	In.
	11	46		II.*	Tr.	Eg.
	13	51		II.	Sh.	Eg.
	19	56		I.	Oc.	Dis.
	23	17	05.4	I.	Ec.	Re.
22	17	03		I.	Tr.	In.
	18	07		I.	Sh.	In.
	19	24		I.	Tr.	Eg.
	20	28		I.	Sh.	Eg.
23	2	56		II.	Oc.	Dis.
	3	05		IV.	Tr.	In.
	7	58		IV.*	Tr.	Eg.
	7	58	40.9	II.*	Ec.	Re.
	12	55		IV.*	Sh.	In.
	14	23		I.	Oc.	Dis.
	17	45	52.2	I.	Ec.	Re.
	17	50		IV.	Sh.	Eg.
	23	49		III.	Oc.	Dis.
24	3	31		III.	Oc.	Re.
	4	15	43.4	III.	Ec.	Dis.
	7	49	02.0	III.*	Ec.	Re.
	11	31		I.*	Tr.	In.
	12	36		I.*	Sh.	In.
	13	52		I.	Tr.	Eg.
	14	57		I.	Sh.	Eg.
	22	02		II.	Tr.	In.
25	0	14		II.	Sh.	In
	0	58		II.	Tr.	Eg.
	3	10		II.	Sh.	Eg.
	8	51		I.	Oc.	Dis.
	12	14	42.8	I.*	Ec.	Re.
26	5	58		I.	Tr.	In.
	7	05		I.*	Sh.	In.
	8	19		I.*	Tr.	Eg.
	9	25		I.*	Sh.	Eg.
	16	09		II.	Oc.	Dis.
	21	17	16.6	II.	Ec.	Re.
27	3	18		I.	Oc.	Dis.
	6	43	30.5	I.*	Ec.	Re.
	13	30		III.	Tr.	In.
	17	12		III.	Tr.	Eg.
	18	03		III.	Sh.	In.
	21	46		III.	Sh.	Eg.
28	0	26		I.	Tr.	In.
	1	34		I.	Sh.	In.
	2	47		I.	Tr.	Eg.
	3	54		I.	Sh.	Eg.
	11	14		II.*	Tr.	In.
	13	32		II.	Sh.	In.
	14	11		II.	Tr.	Eg.
	16	28		II.	Sh.	Eg.
	21	46		I.	Oc.	Dis.
29	1	12	23.2	I.	Ec.	Re.
	18	53		I.	Tr.	In.
	20	03		I.	Sh.	In.
	21	14		I.	Tr.	Eg.
	22	23		I.	Sh.	Eg.
30	5	22		II.	Oc.	Dis.
	10	35	55.5	II.*	Ec.	Re.
	16	13		I.	Oc.	Dis.
	19	41	10.2	I.	Ec.	Re.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.   r *

III. d r

II. r *

IV. d r

Configurations at 10ʰ 00ᵐ for an Inverting Telescope.

Day.	West.		East.
1	·3 ·2	O 1·	·4
2	·3 O	·2	4· ·1●
3	1· O 2· ·3	4·
4	2· O ·1 ·3 4·
5	1· O 3·4·	·2●
6	3· O4· 1· 2·
7	3· 4· ·1 2· O
8	4· ·3 ·2 O 1·
9	4· ·3 ·1O ·2
10	O1·4· O 2· ·3
11	·4 2· O ·1 ·3
12	·4 1· ·2O 3·
13	O3· ·4 O ·1 ·2
14	3· ·1·4 2· O
15	·3 ·2 O 1··4·
16	·3 ·1 O ·2 ·4
17	O1· O ·3 ·4
18	2· O ·1 ·3 ·4
19	·2 O 3· 4·
20	O3· ·1 ·2 4·
21	O2· 3· 1· O 4·
22	·3 ·2 O 1· 4·
23	·3 ·1 4· O ·2
24	4· O 1· ·3 2·
25	4· 2· O ·3 ·1●
26	4· ·2 1· O 3·
27	·4 O 3· ·1 ·2
28	·4 3· 1· O2·
29	·4 3· ·2 O 1·
30	·4 ·3 ·1 O ·2●

WASHINGTON MEAN TIME.

OCTOBER.

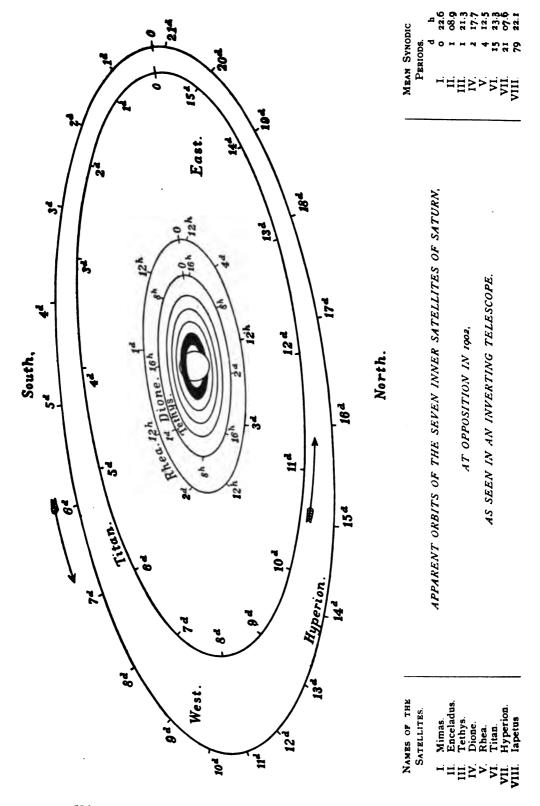| d	h	m	s	Sat.		
1	3	28		III.	Oc.	Dis.
	7	10		III.*	Oc.	Re.
	8	16	38.5	III.*	Ec.	Dis.
	10	11		IV.*	Oc.	Dis.
	11	49	55.9	III.*	Ec.	Re.
	13	21		I.	Tr.	In.
	14	31		I.	Sh.	In.
	15	03		IV.	Oc.	Re.
	15	42		I.	Tr.	Eg.
	16	52		I.	Sh.	Eg.
	21	13	04.4	IV.	Ec.	Dis.
2	0	28		II.	Tr.	In.
	1	56	28.6	IV.	Ec.	Re.
	2	51		II.	Sh.	In.
	3	24		II.	Tr.	Eg.
	5	46		II.	Sh.	Eg.
	10	41		I.*	Oc.	Dis.
	14	10	01.0	I.	Ec.	Re.
3	7	49		I.*	Tr.	In.
	9	00		I.*	Sh.	In.
	10	09		I.*	Tr.	Eg.
	11	21		I.*	Sh.	Eg.
	18	36		II.	Oc.	Dis.
	23	54	37.4	II.	Ec.	Re.
4	5	09		I.	Oc.	Dis.
	8	38	49.0	I.*	Ec.	Re.
	17	12		III.	Tr.	In.
	20	54		III.	Tr.	Eg.
	22	05		III.	Sh.	In.
5	1	48		III.	Sh.	Eg.
	2	16		I.	Tr.	In.
	3	29		I.	Sh.	In.
	4	37		I.	Tr.	Eg.
	5	50		I.	Sh.	Eg.
	13	41		II.	Tr.	In.
	16	09		II.	Sh.	In.
	16	38		II.	Tr.	Eg.
	19	05		II.	Sh.	Eg.
	23	36		I.	Oc.	Dis.
6	3	07	42.1	I.	Ec.	Re.
	20	44		I.	Tr.	In.
	21	58		I.	Sh.	In.
	23	05		I.	Tr.	Eg.
7	0	19		I.	Sh.	Eg.
	7	50		II.*	Oc.	Dis.
	13	13	22.3	II.	Ec.	Re.
	18	04		I.	Oc.	Dis.
	21	36	30.1	I.	Ec.	Re.
8	7	12		III.*	Oc.	Dis.
	10	54		III.*	Oc.	Re.
	12	17	42.6	III.	Ec.	Dis.
	15	12		I.	Tr.	In.
	15	50	57.4	III.	Ec.	Re.
	16	27		I.	Sh.	In.
	17	33		I.	Tr.	Eg.
	18	48		I.	Sh.	Eg.
9	2	57		II.	Tr.	In.
	5	27		II.	Sh.	In.
	5	52		II.	Tr.	Eg.
	8	23		II.*	Sh.	Eg.
	12	32		I.	Oc.	Dis.
	16	05	21.1	I.	Ec.	Re.
	19	34		IV.	Tr.	In.
10	0	26		IV.	Tr.	Eg.
	7	08		IV.*	Sh.	In.
	9	40		I.*	Tr.	In.
	10	56		I.*	Sh.	In.
	12	01		I.	Tr.	Eg.
	12	03		IV.	Sh.	Eg.
	13	16		I.	Sh.	Eg.
10	21	05		II.	Oc.	Dis.
11	2	32	10.1	II.	Ec.	Re.
	7	00		I.	Oc.	Dis.
	10	34	09.5	I.*	Ec.	Re.
	20	59		III.	Tr.	In.
12	0	41		III.	Tr.	Eg.
	2	06		III.	Sh.	In.
	4	08		I.	Tr.	In.
	5	25		I.	Sh.	In.
	5	49		III.	Sh.	Eg.
	6	29		I.*	Tr.	Eg.
	7	45		I.*	Sh.	Eg.
	16	10		II.	Tr.	In.
	18	46		II.	Sh.	In.
	19	07		II.	Tr.	Eg.
	21	41		II.	Sh.	Eg.
13	1	28		I.	Oc.	Dis.
	5	03	02.6	I.	Ec.	Re.
	22	37		I.	Tr.	In.
	23	54		I.	Sh.	In.
14	0	57		I.	Tr.	Eg.
	2	14		I.	Sh.	Eg.
	10	21		II.*	Oc.	Dis.
	15	51	00.7	II.	Ec.	Re.
	19	56		I.	Oc.	Dis.
	23	31	51.0	I.	Ec.	Re.
15	11	01		III.*	Oc.	Dis.
	14	43		III.	Oc.	Re.
	16	19	21.1	III.	Ec.	Dis.
	17	05		I.	Tr.	In.
	18	23		I.	Sh.	In.
	19	26		I.	Tr.	Eg.
	19	52	31.9	III.	Ec.	Re.
	20	43		I.	Sh.	Eg.
16	5	26		II.	Tr.	In.
	8	04		II.*	Sh.	In.
	8	22		II.*	Tr.	Eg.
	11	00		II.*	Sh.	Eg.
	14	25		I.	Oc.	Dis.
	18	00	42.0	I.	Ec.	Re.
17	11	33		I.	Tr.	In.
	12	52		I.	Sh.	In.
	13	54		I.	Tr.	Eg.
	15	12		I.	Sh.	Eg.
	23	37		II.	Oc.	Dis.
18	3	07		IV.	Oc.	Dis.
	5	09	53.8	II.	Ec.	Re.
	7	59		IV.*	Oc.	Re.
	8	53		I.*	Oc.	Dis.
	12	29	30.4	I.	Ec.	Re.
	15	24	20.0	IV.	Ec.	Dis.
	20	07	48.2	IV.	Ec.	Re.
19	0	50		III.	Tr.	In.
	4	32		III.	Tr.	Eg.
	6	02		I.	Tr.	In.
	6	08		III.	Sh.	In.
	7	20		I.*	Sh.	In.
	8	23		I.*	Tr.	Eg.
	9	40		I.*	Sh.	Eg.
	9	51		III.*	Sh.	Eg.
	18	42		II.	Tr.	In.
	21	22		II.	Sh.	In.
	21	38		II.	Tr.	Eg.
20	0	18		II.	Sh.	Eg.
	3	21		I.	Oc.	Dis.
	6	58	23.4	I.*	Ec.	Re.
21	0	30		I.	Tr.	In.
	1	49		I.	Sh.	In.
	2	51		I.	Tr.	Eg.
	4	10		I.	Sh.	Eg.
21	12	54		II.	Oc.	Dis.
	18	28	49.3	II.	Ec.	Re.
	21	50		I.	Oc.	Dis.
22	1	27	12.8	I.	Ec.	Re.
	14	54		III.	Oc.	Dis.
	18	37		III.	Oc.	Re.
	18	59		I.	Tr.	In.
	20	18		I.	Sh.	In.
	20	20	50.3	III.	Ec.	Dis.
	21	20		I.	Tr.	Eg.
	22	39		I.	Sh.	Eg.
	23	53	55.9	III.	Ec.	Re.
23	7	58		II.*	Tr.	In.
	10	40		II.	Sh.	In.
	10	55		II.	Tr.	Eg.
	13	36		II.	Sh.	Eg.
	16	18		I.	Oc.	Dis.
	19	56	02.6	I.	Ec.	Re.
24	13	27		I.	Tr.	In.
	14	47		I.	Sh.	In.
	15	48		I.	Tr.	Eg.
	17	08		I.	Sh.	Eg.
25	2	12		II.	Oc.	Dis.
	7	47	47.1	II.*	Ec.	Re.
	10	47		I.	Oc.	Dis.
	14	24	51.0	I.	Ec.	Re.
26	4	46		III.	Tr.	In.
	7	56		I.*	Tr.	In.
	8	28		III.*	Tr.	Eg.
	9	16		I.*	Sh.	In.
	10	09		III.*	Sh.	In.
	10	17		I.*	Tr.	Eg.
	11	37		I.	Sh.	Eg.
	13	02		IV.	Tr.	In.
	13	52		III.	Sh.	Eg.
	17	55		IV.	Tr.	Eg.
	21	16		II.	Tr.	In.
	23	58		II.	Sh.	In.
27	0	12		II.	Tr.	Eg.
	1	22		IV.	Sh.	In.
	2	54		II.	Sh.	Eg.
	5	16		I.	Oc.	Dis.
	6	18		IV.*	Sh.	Eg.
	8	53	43.8	I.*	Ec.	Re.
28	2	25		I.	Tr.	In.
	3	45		I.	Sh.	In.
	4	46		I.	Tr.	Eg.
	6	06		I.*	Sh.	Eg.
	15	30		II.	Oc.	Dis
	21	06	47.1	II.	Ec.	Re.
	23	44		I.	Oc.	Dis.
29	3	22	32.4	I.	Ec.	Re.
	18	53		III.	Oc.	Dis.
	20	54		I.	Tr.	In.
	22	14		I.	Sh.	In.
	22	35		III.	Oc.	Re.
	23	15		I.	Tr.	Eg.
30	0	22	50.8	III.	Ec.	Dis.
	0	35		I.	Sh.	Eg.
	3	55	49.8	III.	Ec.	Re.
	10	33		II.	Tr.	In.
	13	17		II.	Sh.	In.
	13	29		II.	Tr.	Eg.
	16	12		II.	Sh.	Eg.
	18	13		I.	Oc.	Dis.
	21	51	23.0	I.	Ec.	Re.
31	15	23		I.	Tr.	In.
	16	43		I.	Sh.	In.
	17	43		I.	Tr.	Eg.
	19	04		I.	Sh.	Eg.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.	⊖ r *	III.	⊖ d * r *
II.	⊖ r *	IV.	⊖ d * r *

Configurations at 8ʰ 30ᵐ for an Inverting Telescope.

Day.	West		East
1	·4	○	I· 2· ·3●
2	2· ·I	○	·4 ·3
3	○I· ·2	○	3· ·4
4		○	·I 3· ·2 ·4
5	3· I·	○	2· ·4
6	3· 2·	○	·I 4·
7	·3 I·	○	4· ·2●
8		○	I· 2· 4· ·3●
9	·I ⸲	○	4· ·3
10	·2 4·	○ I·	3·
11	4·	○	·2 ⸲ ·I●
12	4· 3· I·	○	2·
13	4· 3· 2·	○	·I
14	·4 ·3 I· ·2	○	
15	·4 ·3	○	I· ·2
16	·4 ·I 2·	○	·3
17	·4 ·2	○	I· 3·
18	·I	○ ·4	·2 3·
19	3· I·	○	2· ·4
20	3· 2·	○	·I ·4
21	·3 I· ·2	○	·4
22	·3	○	·I ·2 ·4
23	○2· ·I	○	·3 4·
24	·2	○	I· ·3 4·
25	·I	○	·2 3·⸲4·
26	○3 ○I·	○ 4·	2·
27	3· 4·⸲	○	·I●
28	4· ·3 ·2 I·	○	
29	4· ·3	○	·I ·2
30	4· I·	○ 2·	·3
31	·4 2·	○ I·	·3

WASHINGTON MEAN TIME.

DECEMBER.

d	h	m	s	Sat.	Phen.	Type
1	1	29		III.	Tr.	In.
	5	11		III.*	Tr.	Eg.
	6	19		III.	Sh.	In.
	10	01		III.	Sh.	Eg.
	10	32		II.	Tr.	In.
	12	59		II.	Sh.	In.
	13	28		II.	Tr.	Eg.
	15	01		I.	Oc.	Dis.
	15	53		II.	Sh.	Eg.
	18	30	02.1	I.	Ec.	Re.
2	12	13		I.	Tr.	In.
	13	24		I.	Sh.	In.
	14	33		I.	Tr.	Eg.
	15	44		I.	Sh.	Eg.
3	5	01		II.	Oc.	Dis.
	9	31		I.	Oc.	Dis.
	10	18	09.6	II.	Ec.	Re.
	12	58	51.3	I.	Ec.	Re.
4	6	43		I.*	Tr.	In.
	7	53		I.*	Sh.	In.
	9	03		I.	Tr.	Eg.
	10	13		I.	Sh.	Eg.
	15	42		III.	Oc.	Dis.
	19	25		III.	Oc.	Re.
	20	29	32.2	III.	Ec.	Dis.
	23	54		II.	Tr.	In.
5	0	01	39.6	III.	Ec.	Re.
	2	18		II.	Sh.	In.
	2	50		II.	Tr.	Eg.
	4	01		I.	Oc.	Dis.
	5	11		II.*	Sh.	Eg.
	7	27	38.3	I.*	Ec.	Re.
6	1	13		I.	Tr.	In.
	2	22		I.	Sh.	In.
	3	33		I.	Tr.	Eg.
	4	42		I.	Sh.	Eg.
	18	24		II.	Oc.	Dis.
	22	31		I.	Oc.	Dis.
	23	37	22.6	II.	Ec.	Re.
7	1	56	24.2	I.	Ec.	Re.
	11	19		IV.	Oc.	Dis.
	16	04		IV.	Oc.	Re.
	19	43		I.	Tr.	In.
	20	51		I.	Sh.	In.
	22	01	08.7	IV.	Ec.	Dis.
	22	03		I.	Tr.	Eg.
	23	11		I.	Sh.	Eg.
8	2	42	38.1	IV.	Ec.	Re.
	5	47		III.*	Tr.	In.
	9	30		III.	Tr.	Eg.
	10	21		III.	Sh.	In.
	13	16		II.	Tr.	In.
	14	03		III.	Sh.	Eg.
	15	34		II.	Sh.	In.
	16	12		II.	Tr.	Eg.
	17	01		I.	Oc.	Dis.
	18	29		II.	Sh.	Eg.
	20	25	12.4	I.	Ec.	Re.
9	14	13		I.	Tr.	In.
	15	20		I.	Sh.	In.
	16	33		I.	Tr.	Eg.
	17	40		I.	Sh.	Eg.
10	7	48		II.*	Oc.	Dis.
	11	30		I.	Oc.	Dis.
	12	56	35.6	II.	Ec.	Re.
	14	53	50.0	I.	Ec.	Re.
11	8	44		I.	Tr.	In.
	9	49		I.	Sh.	In.
	11	04		I.	Tr.	Eg.

d	h	m	s	Sat.	Phen.	Type
11	12	09		I.	Sh.	Eg.
	20	02		III.	Oc.	Dis.
	23	44		III.	Oc.	Re.
12	0	30	59.3	III.	Ec.	Dis.
	2	39		II.	Tr.	In.
	4	02	52.7	III.	Ec.	Re.
	4	52		II.	Sh.	In.
	5	35		II.*	Tr.	Eg.
	6	00		I.*	Oc.	Dis.
	7	47		II.*	Sh.	Eg.
	9	22	45.1	I.	Ec.	Re.
13	3	14		I.	Tr.	In.
	4	18		I.	Sh.	In.
	5	34		I.*	Tr.	Eg.
	6	38		I.*	Sh.	Eg.
	21	12		II.	Oc.	Dis.
14	0	30		I.	Oc.	Dis.
	2	15	48.7	II.	Ec.	Re.
	3	51	30.4	I.	Ec.	Re.
	21	44		I.	Tr.	In.
	22	47		I.	Sh.	In.
15	0	04		I.	Tr.	Eg.
	1	07		I.	Sh.	Eg.
	10	08		III.	Tr.	In.
	13	51		III.	Tr.	Eg.
	14	22		III.	Sh.	In.
	16	02		II.	Tr.	In.
	18	04		III	Sh.	Eg.
	18	10		II.	Sh.	In.
	18	58		II.	Tr.	Eg.
	19	00		I.	Oc.	Dis.
	21	04		II.	Sh.	Eg.
	22	20	17.3	I.	Ec.	Re.
	22	28		IV.	Tr.	In.
16	3	23		IV.	Tr.	Eg.
	8	05		IV.	Sh.	In.
	13	00		IV.	Sh.	Eg.
	16	14		I.	Tr.	In.
	17	16		I.	Sh.	Ir.
	18	34		I.	Tr.	Eg.
	19	36		I.	Sh.	Eg.
17	10	37		II.	Oc.	Dis.
	13	31		I.	Oc.	Dis.
	15	35	01.5	II.	Ec.	Re.
	16	49	03.4	I.	Ec.	Re.
18	10	44		I.	Tr.	In.
	11	45		I.	Sh.	In.
	13	04		I.	Tr.	Eg.
	14	05		I.	Sh.	Eg.
19	0	24		III.	Oc.	Dis.
	4	07		III.	Oc.	Re.
	4	32	52.6	III.	Ec.	Dis.
	5	25		II.*	Tr.	In.
	7	28		II.*	Sh.	In.
	8	01		I.	Oc.	Dis.
	8	04	30.8	III.	Ec.	Re.
	8	21		II.	Tr.	Eg.
	10	22		II.	Sh.	Eg.
	11	17	48.6	I.	Ec.	Re.
20	5	15		I.*	Tr.	In.
	6	13		I.*	Sh.	In.
	7	35		I.*	Tr.	Eg.
	8	33		I.	Sh.	Eg.
21	0	02		II	Oc.	Dis.
	2	31		I.	Oc.	Dis.
	4	54	13.8	II.	Ec.	Re.
	5	46	32.8	I.*	Ec.	Re.
	23	45		I.	Tr.	In.
22	0	42		I.	Sh.	In.

d	h	m	s	Sat.	Phen.	Type
22	2	05		I.	Tr.	Eg.
	3	02		I.	Sh.	Eg.
	14	32		III.	Tr.	In.
	18	15		III.	Tr.	Eg.
	18	24		III.	Sh.	In.
	18	48		II.	Tr.	In.
	20	46		II.	Sh.	In.
	21	01		I.	Oc.	Dis.
	21	44		II.	Tr.	Eg.
	22	06		III.	Sh.	Eg.
	23	40		II.	Sh.	Eg.
23	0	15	19.1	I.	Ec.	Re.
	18	15		I.	Tr.	In.
	19	11		I.	Sh.	In.
	20	35		I.	Tr.	Eg.
	21	31		I.	Sh.	Eg.
24	7	25		IV.*	Oc.	Dis.
	12	20		IV.	Oc.	Re.
	13	27		II.	Oc.	Dis.
	15	31		I.	Oc.	Dis.
	16	13	33.2	IV.	Ec.	Dis.
	18	13	25.4	II.	Ec.	Re.
	18	44	04.3	I.	Ec.	Re.
	20	53	39.0	IV.	Ec.	Re.
25	12	45		I.	Tr.	In.
	13	40		I.	Sh.	In.
	15	05		I.	Tr.	Eg.
	16	00		I.	Sh.	Eg.
26	4	48		III.	Oc.	Dis.
	8	12		II.	Tr.	In.
	8	31		III.	Oc	Re.
	8	34	05.7	III.	Ec.	Dis.
	10	01		I.	Oc.	Dis.
	10	03		II.	Sh.	In.
	11	08		II.	Tr.	Eg.
	12	05	27.7	III.	Ec.	Re.
	12	58		II.	Sh.	Eg.'
	13	12	48.2	I.	Ec	Re.
27	7	16		I.*	Tr.	In.
	8	09		I.	Sh.	In.
	9	36		I.	Tr.	Eg.
	10	29		I.	Sh.	Eg.
28	2	52		II.	Oc.	Dis.
	4	31		I.	Oc.	Dis.
	7	32	36.5	II.*	Ec.	Re.
	7	41	31.8	I.	Ec.	Re.
29	1	46		I.	Tr.	In.
	2	38		I.	Sh.	In.
	4	06		I.	Tr.	Eg.
	4	58		I.	Sh.	Eg.
	18	58		III.	Tr.	In.
	21	36		II.	Tr.	In.
	22	26		III.	Sh.	In.
	22	41		III.	Tr.	Eg.
	23	02		I.	Oc.	Dis.
	23	21		II.	Sh.	In.
30	0	31		II.	Tr.	Eg.
	2	07		III.	Sh.	Eg.
	2	10	16.7	I.	Ec.	Re.
	2	15		II	Sh.	Eg.
	20	17		I.	Tr.	In.
	21	07		I.	Sh.	In.
	22	37		I.	Tr.	Eg.
	23	27		I.	Sh.	Eg.
31	16	18		II.	Oc.	Dis.
	17	32		I.	Oc.	Dis.
	20	39	01 2	I.	Ec	Re.
	20	51	46.8	II.	Ec.	Re.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. (disk) r *	**III.** (disk) d * r *
II. (disk) r *	(disk) d * r * **IV.**

Configurations at 6ʰ 30ᵐ for an Inverting Telescope.

Day.	West	East
1	4· ·1 3· ○	2·
2	4·· 3· 2· ○	1·
3	4· ·3 ·1 ○	·2●
4	·4 ·3 ○1·	2·
5	·4 2· ○	·3 ··1●
6	·4 ·2 1· ○	·3
7	·4 ○	·1·2 3·
8	○3· 1· ○	2· ·4
9	3· 2· ○	1· ·4
10	·3 ·1 ·2○	·4
11	·3 ○ 1· ·2	·4
12	·2· ○	·3 4··1●
13	·2 1· ○	·3 4··
14	○	·1·2 3· 4··
15	1· ○ 3· ·2·4	
16	3·2· 4· ○	·1
17	3· 4· ·1·2 ○	
18	4· ·3 ○	1· ·2
19	○2· 4· ·1 ○	·3●
20	○1··4 ·2 ○	··3
21	·4 ○ ·1·2	3·
22	·4 1· ○	3· 2·
23	·4 3·· ○	·1
24	3· ·2·1 ·4○	
25	·3 ○	1· ·4·2
26	·1 ○2·	·4 ·3●
27	2· ○1·	·3 ·4
28	○	3· ·4·1·2●
29	1· ○	·3·2· 4·
30	·2·3· ○	·1 4·
31	3· ·2·1· ○	4·

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

AT OPPOSITION IN 1902,

AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "o" are those of the eastern elongation, as seen in an inverting telescope. The times of these elongations may be found from the following tables, and the apparent position of a satellite at any other time may be marked on the diagram by setting off on the proper orbit the elapsed interval in days and hours since the last eastern elongation. The orbits of the five inner satellites are regarded as circular, and the time of any elongation not given in the tables may be readily found from those given by adding or subtracting the proper multiple of the mean synodic period. Mimas can be seen only within a few hours of each elongation, and the time of every elongation visible at Washington is given. For the three outer satellites the eccentricity is taken into account, and the times both of the elongations and of the conjunctions are given. The following abbreviations are used in the tables:—

<div style="text-align:center">

E.,   East Elongation,
I.,   Inferior Conjunction (south of planet),
W.,   West Elongation,
S.,   Superior Conjunction (north of planet).

</div>

MIMAS.
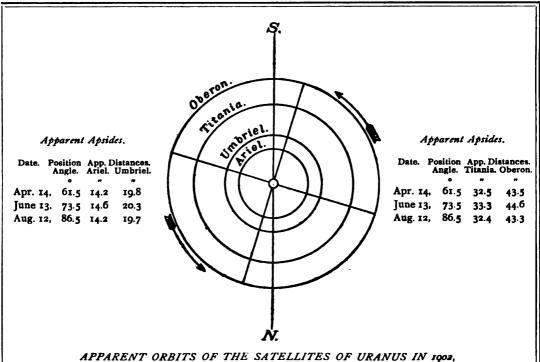
Greatest Elongations Visible at Washington.

	d h		d h		d h		d h		d h		d h
Apr.	8 16.8 W.	May 31	11.3 W.	July	4 09.4 W.	Aug.	2 14.4 W.	Aug. 30	09.6 E.	Oct.	3 07.9 E.
	9 15.4 W.	June 5	15.7 E.		8 15.2 E.		3 13.1 W.	31	08.2 E.		4 06.6 E.
	17 15.7 E.		6 14.4 E.		9 13.8 E.		4 11.7 W.	Sept. 1	06.9 E.		10 09.6 W.
	18 14.3 E.		7 13.0 E.		10 12.4 E.		5 10.3 W.		5 12.6 W.		11 08.2 W.
	25 15.9 W.		8 11.6 E.		11 11.0 E.		6 08.9 W.		6 11.2 W.		12 06.8 W.
	26 14.6 W.		13 15.9 W.		12 09.6 E.		7 07.5 W.		7 09.9 W.		18 09.9 E.
May	3 16.2 E.		14 14.6 W.		13 08.3 E.		10 14.7 E.		8 08.5 W.		19 08.5 E.
	4 14.8 E.		15 13.2 W.		16 15.4 W.		11 13.3 E.		9 07.1 W.		20 07.1 E.
	5 13.4 E.		16 11.8 W.		17 14.0 W.		12 11.9 E.		14 11.5 E.		21 05.8 E.
	11 16.4 W.		17 10.4 W.		18 12.6 W.		13 10.5 E.		15 10.1 E.		27 08.8 W.
	12 15.0 W.		22 14.8 E.		19 11.2 W.		14 09.2 E.		16 08.8 E.		28 07.4 W.
	13 13.7 W.		23 13.4 E.		20 09.9 W.		15 07.8 E.		17 07.4 E.		29 06.0 W.
	14 12.3 W.		24 12.0 E.		21 08.5 W.		19 13.5 W.		22 11.8 W.	Nov.	5 07.7 E.
	20 15.3 E.		25 10.6 E.		24 15.6 E.		20 12.2 W.		23 10.4 W.		6 06.3 E.
	21 13.9 E.		26 09.2 E.		25 14.2 E.		21 10.8 W.		24 09.0 W.		13 08.0 W.
	22 12.5 E.		30 15.0 W.		26 12.8 E.		22 09.4 W.		25 07.6 W.		14 06.6 W.
	28 15.5 W.	July 1	13.6 W.		27 11.5 E.		23 08.0 W.		26 06.2 W.		15 05.3 W.
	29 14.1 W.		2 12.2 W.		28 10.1 E.		28 12.4 E.	Oct. 1	10.7 E.		22 07.0 E.
	30 12.7 W.		3 10.8 W.		29 08.7 E.		29 11.0 E.		2 09.3 E.		23 05.6 E.

ENCELADUS.

	d h		d h		d h		d h		d h		d h
Apr.	6 20.5 E.	Apr. 20	13.4 E.	May	4 06.2 E.	May 17	23.0 E.	May 31	15.8 E.	June	14 08.6 E.
	8 05.4 E.		21 22.3 E.		5 15.1 E.		19 07.9 E.	June 2	00.7 E.		15 17.5 E.
	9 14.3 E.		23 07.1 E.		7 00.0 E.		20 16.8 E.		3 09.6 E.		17 02.3 E.
	10 23.2 E.		24 16.0 E.		8 08.9 E.		22 01.7 E.		4 18.5 E.		18 11.2 E.
	12 08.0 E.		26 00.9 E.		9 17.8 E.		23 10.6 E.		6 03.3 E.		19 20.1 E.
	13 16.9 E.		27 09.8 E.		11 02.6 E.		24 19.4 E.		7 12.2 E.		21 05.0 E.
	15 01.8 E.		28 18.7 E.		12 11.5 E.		26 04.3 E.		8 21.1 E.		22 13.8 E.
	16 10.7 E.		30 03.6 E.		13 20.4 E.		27 13.2 E.		10 06.0 E.		23 22.7 E.
	17 19.6 E.	May 1	12.4 E.		15 05.3 E.		28 22.1 E.		11 14.8 E.		25 07.6 E.
	19 04.5 E.		2 21.3 E.		16 14.2 E.		30 07.0 E.		12 23.7 E.		26 16.5 E.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ENCELADUS—(Continued).

d	h	d	h	d	h	d	h	d	h	d	h
June 28	01.4 E.	July 18	14.5 E.	Aug. 8	03.6 E.	Aug. 28	16.8 E.	Sept. 18	06.1 E.	Oct. 8	19.4 E.
29	10.2 E.	19	23.4 E.	9	12.5 E.	30	01.7 E.	19	15.0 E.	10	04.3 E.
30	19.1 E.	21	08.2 E.	10	21.4 E.	31	10.6 E.	20	23.8 E.	11	13.2 E.
July 2	04.0 E.	22	17.1 E.	12	06.2 E.	Sept. 1	19.5 E.	22	08.7 E.	12	22.1 E.
3	12.8 E.	24	02.0 E.	13	15.1 E.	3	04.3 E.	23	17.6 E.	14	07.0 E.
4	21.7 E.	25	10.9 E.	15	00.0 E.	4	13.2 E.	25	02.5 E.	15	15.9 E.
6	06.6 E.	26	19.7 E.	16	08.9 E.	5	22.1 E.	26	11.4 E.	17	00.8 E.
7	15.5 E.	28	04.6 E.	17	17.8 E.	7	07.0 E.	27	20.3 E.	18	09.6 E.
9	00.3 E.	29	13.5 E.	19	02.6 E.	8	15.9 E.	29	05.2 E.	19	18.5 E.
10	09.2 E.	30	22.4 E.	20	11.5 E.	10	00.8 E.	30	14.0 E.	21	03.4 E.
11	18.1 E.	Aug. 1	07.2 E.	21	20.4 E.	11	09.6 E.	Oct. 1	22.9 E.	22	12.3 E.
13	03.0 E.	2	16.1 E.	23	05.3 E.	12	18.5 E.	3	07.8 E.	23	21.2 E.
14	11.8 E.	4	01.0 E.	24	14.2 E.	14	03.4 E.	4	16.7 E.	25	06.1 E.
15	20.7 E.	5	09.8 E.	25	23.0 E.	15	12.3 E.	6	01.6 E.	26	15.0 E.
17	05.6 E.	6	18.7 E.	27	07.9 E.	16	21.2 E.	7	10.5 E.	27	23.9 E.

TETHYS.

d	h	d	h	d	h	d	h	d	h	d	h
Apr. 3	01.8 E.	May 8	22.7 E.	June 13	19.3 E.	July 19	15.8 E.	Aug. 24	12.3 E.	Sept. 29	09.1 E.
4	23.1 E.	10	20.0 E.	15	16.6 E.	21	13.1 E.	26	09.6 E.	Oct. 1	06.4 E.
6	20.4 E.	12	17.3 E.	17	13.9 E.	23	10.4 E.	28	06.9 E.	3	03.8 E.
8	17.7 E.	14	14.6 E.	19	11.2 E.	25	07.6 E.	30	04.2 E.	5	01.1 E.
10	15.0 E.	16	11.9 E.	21	08.5 E.	27	04.9 E.	Sept. 1	01.5 E.	6	22.4 E.
12	12.4 E.	18	09.2 E.	23	05.8 E.	29	02.2 E.	2	22.8 E.	8	19.7 E.
14	09.7 E.	20	06.5 E.	25	03.0 E.	30	23.5 E.	4	20.1 E.	10	17.0 E.
16	07.0 E.	22	03.8 E.	27	00.3 E.	Aug. 1	20.8 E.	6	17.4 E.	12	14.3 E.
18	04.3 E.	24	01.1 E.	28	21.6 E.	3	18.1 E.	8	14.7 E.	14	11.7 E.
20	01.6 E.	25	22.4 E.	30	18.9 E.	5	15.4 E.	10	12.0 E.	16	09.0 E.
21	22.9 E.	27	19.7 E.	July 2	16.2 E.	7	12.7 E.	12	09.3 E.	18	06.3 E.
23	20.2 E.	29	17.0 E.	4	13.5 E.	9	10.0 E.	14	06.6 E.	20	03.6 E.
25	17.5 E.	31	14.3 E.	6	10.8 E.	11	07.3 E.	16	03.9 E.	22	01.0 E.
27	14.8 E.	June 2	11.6 E.	8	08.0 E.	13	04.6 E.	18	01.2 E.	23	22.3 E.
29	12.1 E.	4	08.8 E.	10	05.3 E.	15	01.8 E.	19	22.6 E.	25	19.6 E.
May 1	09.4 E.	6	06.1 E.	12	02.6 E.	16	23.1 E.	21	19.9 E.	27	16.9 E.
3	06.8 E.	8	03.4 E.	13	23.9 E.	18	20.4 E.	23	17.2 E.	29	14.2 E.
5	04.1 E.	10	00.7 E.	15	21.2 E.	20	17.7 E.	25	14.5 E.	31	11.6 E.
7	01.4 E.	11	22.0 E.	17	18.5 E.	22	15.0 E.	27	11.8 E.	Nov. 2	08.9 E.

DIONE.

d	h	d	h	d	h	d	h	d	h	d	h
Apr. 7	21.5 E.	May 13	11.5 E.	June 18	01.1 E.	July 23	14.5 E.	Aug. 28	04.0 E.	Oct. 2	17.9 E.
10	15.2 E.	16	05.2 E.	20	18.7 E.	26	08.2 E.	30	21.7 E.	5	11.6 E.
13	08.9 E.	18	22.8 E.	23	12.4 E.	29	01.8 E.	Sept. 2	15.4 E.	8	05.3 E.
16	02.6 E.	21	16.5 E.	26	06.0 E.	31	19.4 E.	5	09.0 E.	10	23.0 E.
18	20.3 E.	24	10.2 E.	28	23.7 E.	Aug. 3	13.1 E.	8	02.7 E.	13	16.7 E.
21	14.0 E.	27	03.8 E.	July 1	17.3 E.	6	06.8 E.	10	20.4 E.	16	10.4 E.
24	07.7 E.	29	21.5 E.	4	11.0 E.	9	00.4 E.	13	14.1 E.	19	04.1 E.
27	01.4 E.	June 1	15.2 E.	7	04.6 E.	11	18.1 E.	16	07.8 E.	21	21.8 E.
29	19.1 E.	4	08.8 E.	9	22.3 E.	14	11.7 E.	19	01.4 E.	24	15.6 E.
May 2	12.8 E.	7	02.5 E.	12	15.9 E.	17	05.4 E.	21	19.1 E.	27	09.3 E.
5	06.5 E.	9	20.2 E.	15	09.6 E.	19	23.0 E.	24	12.8 E.	30	03.0 E.
8	00.1 E.	12	13.8 E.	18	03.2 E.	22	16.7 E.	27	06.5 E.	Nov. 1	20.7 E.
10	17.8 E.	15	07.5 E.	20	20.9 E.	25	10.4 E.	30	00.2 E.	4	14.4 E.

RHEA.

d	h			d	h	
Apr.	19	04.9 E.	July	27	12.8 E.
	23	17.3 E.	Aug.	1	01.1 E.
	28	05.8 E.		5	13.4 E.
May	2	18.2 E.		10	01.7 E.
	7	06.6 E.		14	14.1 E.
	11	19.0 E.		19	02 4 E.
	16	07.4 E.		23	14.8 E.
	20	19.8 E.		28	03.1 E.
	25	08 2 E.	Sept.	1	15.5 E.
	29	20.6 E.		6	03.9 E.
June	3	08.9 E.		10	16.2 E.
	7	21.3 E.		15	04.6 E.
	12	09 6 E.		19	17.0 E.
	16	21.9 E.		24	05.5 E.
	21	10.3 E.		28	17.9 E.
	25	22.6 E.	Oct.	3	06.4 E.
	30	10.9 E.		7	18.8 E.
July	4	23.2 E.		12	07.3 E.
	9	11.5 E.		16	19.8 E.
	13	23.8 E.		21	08.2 E.
	18	12.2 E.		25	20.7 E.
	23	00.4 E.		30	09.2 E.

TITAN.

d	h			d	h	
May	4	05.4 I.	July	30	16.2 S.
	8	06.9 W.	Aug.	3	15.0 E.
	12	04.0 S.		7	17.1 I.
	16	02.9 E.		11	17.1 W.
	20	05.0 I.		15	13.8 S.
	24	05.4 W.		19	12.7 E.
	28	02.4 S.		23	14.8 I.
June	1	01.0 E.		27	14.9 W.
	5	03.1 I.		31	11.7 S.
	9	03.3 W.	Sept.	4	10.6 E.
	13	00.2 S.		8	12.9 I.
	16	22.8 E.		12	12.9 W.
	21	00 9 I.		16	09.6 S.
	25	01.0 W.		20	08.9 E.
	28	21.7 S.		24	11.2 I.
July	2	20.4 E.		28	11.3 W.
	6	22.2 I.	Oct.	2	08.5 S.
	10	22.3 W.		6	07.8 E.
	14	19.0 S.		10	10.3 I.
	18	17.7 E.		14	10.5 W.
	22	19.8 I.		18	07.6 S.
	26	19.6 W.		22	07.0 E.

HYPERION.

	d			d	
Apr	1.1 E.	July	27.4 W.
	5.8 I.	Aug.	2.3 S.
	11.9 W.		6.9 E
	17.9 S.		11.5 I.
	22.6 E.		17.6 W.
May	3.3 I.		23.5 S.
	3.3 W.		28.0 E.
	9.3 S.	Sept.	1.7 I.
	13.9 E.		7.8 W.
	18.6 I.		13.6 S.
	24.6 W.		18.2 E.
	30.6 S.		22.9 I.
June	4.2 E.		29.0 W.
	8 9 I.	Oct.	4.9 S.
	14.9 W.		9.4 E.
	20.9 S.		14.2 I.
	25.5 E.		20.2 W.
	30.2 I.		26.1 S
July	6.2 W.		30.7 E.
	12.1 S.	Nov.	4.4 I.
	16.7 E.		10.5 W.
	21.4 I.		16.4 S.

IAPETUS.

	d			d			d			d			d			d	
Apr.	4.4 W.	May	14.0 E	June	22.6 W.	Aug.	0.2 E.	Sept.	8.7 W.	Oct.	18.1 E.
	24.9 S.	June	2 2 I.	July	12.5 S.		19.3 I.		28.9 S.	Nov.	6.8 I.

THE APPARENT ELEMENTS OF SATURN'S RINGS.

Greenwich Mean Noon.	a Outer Major Axis.	b Outer Minor Axis.	p Inclination of Northern Semi-Minor Axis to Circle of Declination from North to East.	l The Elevation of the Earth above the Plane of the Rings.	l' The Elevation of the Sun above the Plane of the Rings.	u Earth's Longitude from Saturn counted on the Plane of the Rings from their Ascending Node on the—Equator.	u' Ecliptic.
	"	"	° '	° '	° '	° '	° '
Jan. 0	34.05	13 91	+7 14.7	+24 06.6	+23 52.7	344 46.7	302 34.5
20	34.06	13.59	7 18.5	23 30.8	23 44.7	347 16.4	305 04 3
Feb. 9	34.39	13.38	7 21.3	22 53.9	23 36.5	349 39.7	307 27.6
Mar. 1	35.03	13.30	7 22.9	22 19.0	23 28.3	351 47.3	309 35.3
21	35.95	13.36	7 23.8	21 49.5	23 19.8	353 30.9	311 18.9
Apr. 10	37.08	13.58	+7 24.2	+21 28.7	+23 11.1	354 43.8	312 31.3
30	38.34	13.94	7 24.4	21 19.2	23 02.2	355 18.3	313 06.6
May 20	39.59	14.43	7 24.4	21 22.0	22 53.4	355 14.5	313 02.9
June 9	40.67	14.98	7 24.3	21 36.8	22 44.3	354 33.0	312 21.5
29	41.40	15.52	7 24.1	22 00.7	22 35.0	353 21.4	311 10.0
July 19	41.64	15.92	+7 23.5	+22 28.8	+22 25.6	351 53.2	309 41.9
Aug. 8	41.34	16.10	7 22.6	22 55.7	22 16 0	350 25.5	308 14.3
28	40.56	16.03	7 21.6	23 16.6	22 06.3	349 16.2	307 05.1
Sept. 17	39.44	15.71	7 21.0	23 28.0	21 56 5	348 39.1	306 27.9
Oct. 7	38.18	15.21	7 21.1	23 28.7	21 46 4	348 41.6	306 30.6
27	36.94	14.61	+7 21 8	+23 18.1	+21 36.3	349 25.1	307 14.1
Nov. 16	35.84	13.98	7 23.1	22 56 9	21 26.0	350 45.4	308 34.6
Dec. 6	34.99	13.36	7 24.5	22 26.4	21 15.5	352 35.4	310 24.7
26	34.42	12.78	7 25.0	21 47.5	21 04.9	354 46.2	312 35.6
31	34 33	12.64	+7 25.1	+21 36.9	+21 02.2	355 20.9	313 10.4

The factor to be multiplied by a and b to obtain the axes of—

    The inner ellipse of the outer ring = 0.8801,   log factor = 9.9445
    The outer ellipse of the inner ring = 0 8599,   log factor = 9.9344
    The inner ellipse of the inner ring = 0.6650,   log factor = 9 8228
    The inner ellipse of the dusky ring = 0.5130,   log factor = 9.7101

NOTE.—The positive sign of l indicates that the visible surface of the rings is the northern one.

Apparent Apsides.

Date.	Position Angle.	App. Distances. Ariel.	Umbriel.
	°	″	″
Apr. 14,	61.5	14.2	19.8
June 13,	73.5	14.6	20.3
Aug. 12,	86.5	14.2	19.7

Apparent Apsides.

Date.	Position Angle.	App. Distances. Titania.	Oberon.
	°	″	″
Apr. 14,	61.5	32.5	43.5
June 13,	73.5	33.3	44.6
Aug. 12,	86.5	32.4	43.3

APPARENT ORBITS OF THE SATELLITES OF URANUS IN 1902,
AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
East.	West.	East.	West.	East.	West.	East and West.
d h	d h	d h	d h	d h	d h	d h
Apr. 3 09.1	Apr. 7 03.9	Apr. 1 16.3	Apr. 7 21.5	Mar. 21 07.4	Mar. 25 16.0	Apr. 19 21.3 E.
10 22.6	14 17.4	9 23.3	16 04.6	30 00.4	Apr. 3 09.0	26 15.5 W.
18 12.2	22 07.0	18 06.4	24 11.7	Apr. 7 17.6	12 02.2	May 3 10.0 E.
26 01.8	29 20.6	26 13.5	May 2 19.0	16 10.8	20 19.6	10 04.5 W.
May 3 15.4	May 7 10.3	May 4 20.8	11 02.2	25 04.3	29 13.1	16 23.2 E.
11 05.1	15 00.0	13 04.1	19 09.6	May 3 22.0	May 8 06.9	23 18.0 W.
18 18.8	22 13.7	21 11.5	27 17.1	12 15.8	17 00.8	30 12.9 E.
26 08.6	30 03.5	29 18.9	June 5 00.5	21 09.8	25 18.8	June 6 07.9 W.
June 2 22.4	June 6 17.2	June 7 02.4	13 08.0	30 03.9	June 3 13.0	13 03.0 E.
10 12.1	14 07.0	15 09.9	21 15.5	June 7 22.1	12 07.2	19 22.0 W.
18 01.9	21 20.8	23 17.4	29 23.1	16 16.3	21 01.4	26 17.1 E.
25 15.7	29 10.6	July 2 00.9	July 8 06.6	25 10.6	29 19.7	July 3 12.1 W.
July 3 05.5	July 7 00.4	10 08.4	16 14.0	July 4 04.8	July 8 13.9	10 07.1 E.
10 19.3	14 14.2	18 15.8	24 21.4	12 22.9	17 08.0	17 02.0 W.
18 09.0	22 03.9	26 23.2	Aug. 2 04.7	21 17.0	26 01.9	23 20.7 E.
25 22.8	29 17.6	Aug. 4 06.5	10 11.9	30 10.8	Aug. 3 19.6	30 15.3 W.
Aug. 2 12.5	Aug. 6 07.3	12 13.7	18 19.0	Aug. 8 04.4	12 13.2	Aug. 6 09.6 E.
10 02.1	13 20.9	20 20.8	27 02.0	16 21.8	21 06.4	13 03.8 W.
17 15.7	21 10.4	29 03.7	Sept. 4 08.9	25 15.0	29 23.4	19 21.7 E.
25 05.2	29 00.0	Sept. 6 10.6	12 15.6	Sept. 3 07.8	Sept. 7 16.2	26 15.5 W.
Sept. 1 18.7	Sept. 5 13.4	14 17.3	20 22.3	12 00.5	16 08.7	Sept. 2 08.9 E.
9 08.1	13 02.8	22 23.9	29 04.8	20 16.8	25 00.9	9 02.2 W.
16 21.4	20 16.1	Oct. 1 06.5	Oct. 7 11.3	29 08.9	Oct. 3 16.9	15 19.2 E.
24 10.7	28 05.4	9 12.9	15 17.7	Oct. 8 00.8	12 08.6	22 12.0 W.
Oct. 2 00.0	Oct. 5 18.6	17 19.2	24 00.0	16 16.5	21 00.3	29 04.5 E.

	d h		d h
Period of Ariel,	2 12.489	Period of Titania,	8 16.942
Period of Umbriel,	4 03.460	Period of Oberon,	13 11.119

NOTE.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.
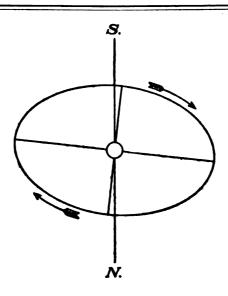
Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
	°	″
Feb. 5,	79.4	+ 16.7
Sept. 29,	85.3	+ 16.4
Dec. 18,	83.8	+ 16.9

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE IN 1902,
AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

East.		West.		East.		West.		East.		West.	
	d h		d h		d h		d h		d h		d h
Jan.	4 06.7	Jan.	1 08.1	Mar.	15 19.8	Mar.	12 21.3	Oct.	25 01.0	Oct.	27 23.5
	10 03.8		7 05.2		21 16.9		18 18.4		30 22.0	Nov.	2 20.6
	16 00.9		13 02.4		27 13.9		24 15.4	Nov.	5 19.1		8 17.7
	21 22.1		18 23.5	Apr.	2 11.0		30 12.4		11 16.2		14 14.7
	27 19.2		24 20.6	Sept.	8 00.8	Sept.	10 23.3		17 13.3		20 11.8
Feb.	2 16.3		30 17.7		13 21.8		16 20.3		23 10.4		26 08.9
	8 13.4	Feb.	5 14.8		19 18.8		22 17.3		29 07.5	Dec.	2 06.1
	14 10.5		11 11.9		25 15.8		28 14.3	Dec.	5 04.6		8 03.2
	20 07.6		17 09.0	Oct.	1 12.8	Oct.	4 11.3		11 01.7		14 00.3
	26 04.7		23 06.1		7 09.8		10 08.4		16 22.8		19 21.4
Mar.	4 01.7	Mar.	1 03.2		13 06.9		16 05.4		22 20.0		25 18.6
	9 22.8		7 00.3		19 03.9		22 02.4		28 17.1		31 15.7

The above times are the instants of each passage of the satellite through the apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, bearing in mind that the radius vector of the satellite describes equal areas in equal times.

The period of the satellite of Neptune is $5^d 21.044^h$.

NOTE.—In the preceding diagrams the central circle represents the planet and is on the same scale as the orbits.

WASHINGTON MEAN TIME.

PLANETARY CONFIGURATIONS.

d	h	m		° '
Jan. 1	13	—	☌ ☿ ☉ Superior.	
2	08	—	☿ in ♌	
5	22	—	☌ ☿ ♄ . . . . ☿ — 2 11	
6	16	53	☌ ♅ ☽ . . . . . . ♅ — 3 07	
8	23	—	☌ ☿ ♃ . . . . . . ☿ — 1 50	
9	05	—	☌ ♄ ☉ Superior.	
9	05	24	☌ ♄ ☽ . . . . . . ♄ — 4 34	
9	08	—	♀ Greatest brilliancy.	
9	14	—	♂ Greatest Hel. Lat. S.	
9	15	08	☌ ♃ ☽ . . . . . . ♃ — 5 11	
9	17	18	☌ ☿ ☽ . . . . . . ☿ — 7 04	
10	18	51	☌ ♂ ☽ . . . . . . ♂ — 6 22	
12	12	48	☌ ♀ ☽ . . . . . . ♀ — 3 08	
12	22	—	☿ Greatest Hel. Lat. S.	
15	06	—	☌ ♃ ☉ Superior.	
20	23	01	☌ ♆ ☽ . . . . . . ♆ + 2 37	
22	05	—	♀ Stationary.	
23	08	—	☌ ☿ ♂ . . . . . . ☿ — 0 25	
31	21	—	☌ ☿ ♀ . . . . . . ☿ — 6 34	
31	22	—	☿ in ♌	
Feb. 2	17	—	☿ Greatest elong. E. 18 17	
2	22	—	♂ in Perihelion.	
3	03	25	☌ ♅ ☽ . . . . . . ♅ — 3 23	
4	21	—	♀ in Perihelion.	
5	04	—	☌ ♀ ♂ . . . . . . ♀ + 8 38	
5	12	—	☿ in Perihelion.	
5	19	33	☌ ♄ ☽ . . . . . . ♄ — 4 46	
6	11	40	☌ ♃ ☽ . . . . . . ♃ — 5 26	
8	12	14	☌ ♀ ☽ . . . . . . ♀ + 3 09	
8	15	—	☿ Stationary.	
8	20	59	☌ ♂ ☽ . . . . . . ♂ — 5 58	
9	03	42	☌ ☿ ☽ . . . . . . ☿ — 2 23	
12	05	—	☌ ☿ ♂ . . . . . . ☿ + 4 15	
14	06	—	☌ ♀ ☉ Inferior.	
15	19	—	☿ Greatest Hel. Lat. N.	
17	05	24	☌ ♆ ☽ . . . . . . ♆ + 2 48	
18	04	—	☌ ☿ ☉ Inferior.	
26	20	—	♀ Greatest Hel. Lat. N.	
Mar. 2	09	—	☿ Stationary.	
2	13	27	☌ ♅ ☽ . . . . . . ♅ — 3 41	
5	09	59	☌ ♄ ☽ . . . . . . ♄ — 5 01	
5	15	—	♀ Stationary.	
6	08	33	☌ ♃ ☽ . . . . . . ♃ — 5 41	
7	01	31	☌ ♀ ☽ . . . . . . ♀ + 2 11	
7	12	22	☌ ☿ ☽ . . . . . . ☿ — 4 20	
9	20	50	☌ ♂ ☽ . . . . . . ♂ — 4 33	
10	00	—	♆ Stationary.	
11	07	—	☿ in ♓	
12	00	—	□ ♅ ☉	
16	10	38	☌ ♆ ☽ . . . . . . ♆ + 3 02	
16	21	—	☿ Greatest elong. W. 27 40	
19	13	—	□ ♆ ☉	
20	19	—	♀ Greatest brilliancy.	

d	h	m		° '
Mar. 20	20	—	☉ enters ♈, Spring com.	
21	12	—	☿ in Aphelion.	
26	10	—	♅ Stationary.	
29	08	—	☌ ♂ ☉ Superior.	
29	21	56	☌ ♅ ☽ . . . . . . ♅ — 3 53	
Apr. 1	22	58	☌ ♄ ☽ . . . . . . ♄ — 5 15	
3	04	03	☌ ♃ ☽ . . . . . . ♃ — 5 53	
4	13	05	☌ ♀ ☽ . . . . . . ♀ — 2 28	
6	12	45	☌ ☿ ☽ . . . . . . ☿ — 6 01	
7	18	42	☌ ♂ ☽ . . . . . . ♂ — 2 25	
7	—	—	☉ Eclipsed; invis. at Wash.	
10	21	—	☿ Greatest Hel. Lat. S.	
12	17	12	☌ ♆ ☽ . . . . . . ♆ + 3 11	
17	18	—	□ ♄ ☉	
22	—	—	☽ Eclipsed, invis. at Wash.	
23	07	—	☌ ☿ ♂ . . . . . . ☿ — 0 40	
23	21	—	♀ in ♓	
25	07	—	♀ Greatest elong. W. 46 11	
26	04	18	☌ ♅ ☽ . . . . . . ♅ — 3 55	
28	07	—	☌ ☿ ☉ Superior.	
29	08	48	☌ ♄ ☽ . . . . . . ♄ — 5 20	
29	21	—	☿ in ♌	
30	19	59	☌ ♃ ☽ . . . . . . ♃ — 5 58	
May 3	23	44	☌ ♀ ☽ . . . . . . ♀ — 4 19	
4	12	—	☿ in Perihelion.	
6	15	10	☌ ♂ ☽ . . . . . . ♂ — 0 03	
6	16	—	□ ♃ ☉	
7	—	—	☉ Eclipsed; invis. at Wash.	
7	17	—	♄ Stationary.	
7	23	19	☌ ☿ ☽ . . . . . . ☿ + 3 32	
10	02	33	☌ ♆ ☽ . . . . . . ♆ + 3 14	
14	19	—	☿ Greatest Hel. Lat. N.	
23	08	51	☌ ♅ ☽ . . . . . . ♅ — 3 49	
23	23	—	♄ in ♓	
26	14	51	☌ ♄ ☽ . . . . . . ♄ — 5 18	
28	01	—	☿ Greatest elong. E. 23 04	
28	02	—	♀ in Aphelion.	
28	06	41	☌ ♃ ☽ . . . . . . ♃ — 5 57	
28	22	—	☌ ☿ ♆ . . . . . . ☿ + 2 52	
June 2	13	55	☌ ♀ ☽ . . . . . . ♀ — 2 44	
4	10	39	☌ ♂ ☽ . . . . . . ♂ + 2 09	
5	20	—	♃ Stationary.	
5	23	—	♂ in ♌	
6	14	15	☌ ♆ ☽ . . . . . . ♆ + 3 14	
6	22	35	☌ ☿ ☽ . . . . . . ☿ + 4 39	
7	06	—	☿ in ♓	
10	08	—	☿ Stationary.	
10	10	—	☍ ♅ ☉	
17	11	—	☿ in Aphelion.	
19	12	36	☌ ♅ ☽ . . . . . . ♅ — 3 44	
19	18	—	♀ Greatest Hel. Lat. S.	
21	16	—	☉ enters ♋, Summer com.	
22	17	57	☌ ♄ ☽ . . . . . . ♄ — 5 11	

WASHINGTON MEAN TIME.

PLANETARY CONFIGURATIONS.

d	h	m		
June 22	22	—	☌ ♅ ☉ Superior.	
23	03	—	☌ ☿ ☉ Inferior.	
23	09	—	☌ ☿ ♅ . . . . ☿ — 3 01	
24	11	35	☌ ♃ ☽ . . . . ♃ — 5 54	
July 2	04	52	☌ ♀ ☽ . . . . ♀ + 0 42	
3	05	17	☌ ♂ ☽ . . . . ♂ + 3 58	
3	19	34	☌ ☿ ☽ . . . . ☿ — 0 24	
3	20	—	⊕ in Aphelion.	
4	02	34	☌ ♅ ☽ . . . . ♅ + 3 16	
4	14	—	☿ Stationary.	
7	20	—	☿ Greatest Hel. Lat S.	
15	05	—	☌ ☿ ♅ . . . . ☿ — 1 34	
15	09	—	☿ Greatest elong. W. 20 35	
16	16	53	☌ ⊚ ☽ . . . . ⊚ — 3 46	
17	08	—	☍ ♄ ☉	
19	20	06	☌ ♄ ☽ . . . . ♄ — 5 09	
21	12	19	☌ ♃ ☽ . . . . ♃ — 5 55	
23	09	—	☌ ♂ ♅ . . . . ♂ + 1 37	
26	20	—	☿ in ♌	
27	02	—	☌ ♀ ♅ . . . . ♀ + 0 11	
31	11	—	☿ in Perihelion.	
31	13	40	☌ ♅ ☽ . . . . ♅ + 3 24	
31	16	—	☌ ♀ ♂ . . . . ♀ — 1 18	
31	22	52	☌ ♂ ☽ . . . . ♂ + 5 19	
31	23	08	☌ ♀ ☽ . . . . ♀ + 4 02	
Aug. 2	13	29	☌ ☿ ☽ . . . . ☿ + 6 18	
5	00	—	☍ ♃ ☉	
10	18	—	☿ Greatest Hel. Lat. N.	
10	21	—	☌ ☿ ☉ Superior.	
12	22	43	☌ ⊚ ☽ . . . . ⊚ — 3 56	
15	01	—	♀ in ♌	
15	23	25	☌ ♄ ☽ . . . . ♄ — 5 14	
17	12	22	☌ ♃ ☽ . . . . ♃ — 6 01	
26	18	—	⊚ Stationary.	
27	22	19	☌ ♅ ☽ . . . . ♅ + 3 36	
29	15	00	☌ ♂ ☽ . . . . ♂ + 6 08	
30	21	32	☌ ♀ ☽ . . . . ♀ + 5 45	
Sept. 3	02	31	☌ ☿ ☽ . . . . ☿ + 2 26	
3	05	—	☿ in ♉	
9	06	30	☌ ⊚ ☽ . . . . ⊚ — 4 08	
10	08	—	☐ ⊚ ☉	
12	05	14	☌ ♄ ☽ . . . . ♄ — 5 24	
13	10	—	☿ in Aphelion.	
13	15	21	☌ ♃ ☽ . . . . ♃ — 6 10	
17	11	—	♀ in Perihelion.	
20	02	—	☌ ☿ a Virginis . . * + 0 13	
23	07	—	☉ enters ♎, Autumn com.	
24	04	38	☌ ♅ ☽ . . . . ♅ + 3 45	
24	11	—	☿ Greatest elong. E. 26 11	
25	16	—	♄ Stationary.	
27	01	—	☐ ♅ ☉	
27	05	13	☌ ♂ ☽ . . . . ♂ + 6 24	
29	22	01	☌ ♀ ☽ . . . . ♀ + 4 36	

d	h	m		
Oct. 2	21	37	☌ ☿ ☽ . . . . ☿ — 4 20	
3	20	—	☿ Greatest Hel. Lat. S.	
3	20	—	♃ Stationary.	
6	15	51	☌ ⊚ ☽ . . . . ⊚ — 4 18	
6	23	—	♅ Stationary.	
7	05	—	☿ Stationary.	
9	12	—	♀ Greatest Hel. Lat. N.	
9	13	42	☌ ♄ ☽ . . . . ♄ — 5 32	
10	23	03	☌ ♃ ☽ . . . . ♃ — 6 14	
15	02	—	☐ ♄ ☉	
16	—	—	☽ Eclipsed; vis. at Wash.	
19	02	—	☌ ☿ ☉ Inferior.	
21	10	18	☌ ♅ ☽ . . . . ♅ + 3 48	
22	21	—	☿ in ♌	
23	04	—	☌ ☿ ♀ . . . . ☿ — 1 20	
25	17	10	☌ ♂ ☽ . . . . ♂ + 6 05	
27	10	—	☿ in Perihelion.	
27	13	—	☿ Stationary.	
29	06	04	☌ ☿ ☽ . . . . ☿ + 2 21	
30	00	24	☌ ♀ ☽ . . . . ♀ + 0 54	
30	—	—	☉ Eclipsed; invis. at Wash.	
Nov. 1	09	—	☐ ♃ ☉	
3	01	56	☌ ⊚ ☽ . . . . ⊚ — 4 21	
3	20	—	☿ Greatest elong. W. 18 50	
6	00	07	☌ ♄ ☽ . . . . ♄ — 5 33	
6	17	—	☿ Greatest Hel. Lat. N.	
7	11	06	☌ ♃ ☽ . . . . ♃ — 6 09	
17	17	28	☌ ♅ ☽ . . . . ♅ + 3 42	
23	02	42	☌ ♂ ☽ . . . . ♂ + 5 19	
28	09	—	☌ ♀ ☉ Superior.	
28	15	41	☌ ☿ ☽ . . . . ☿ — 2 45	
29	08	15	☌ ♀ ☽ . . . . ♀ — 3 17	
30	04	—	☿ in ♐	
30	11	58	☌ ⊚ ☽ . . . . ⊚ — 4 22	
Dec. 3	11	37	☌ ♄ ☽ . . . . ♄ — 5 27	
4	14	—	♀ in ♐	
5	02	07	☌ ♃ ☽ . . . . ♃ — 5 52	
8	04	—	♂ Greatest Hel. Lat. N.	
10	10	—	☿ in Aphelion.	
10	14	—	☌ ♀ ⊚ . . . . ♀ — 0 08	
11	19	—	☌ ☿ ☉ Superior.	
13	01	—	☌ ☿ ⊚ . . . . ☿ — 1 13	
13	16	—	☌ ⊚ ☉ Superior.	
15	02	55	☌ ♅ ☽ . . . . ♅ + 3 36	
21	09	26	☌ ♂ ☽ . . . . ♂ + 4 22	
21	15	—	☌ ♀ ☽ . . . . ♀ — 1 16	
22	01	—	☉ enters ♑, Winter com.	
22	03	—	☐ ♂ ☉	
24	08	—	☍ ♅ ☉	
27	21	34	☌ ⊚ ☽ . . . . ⊚ — 4 26	
29	22	43	☌ ♀ ☽ . . . . ♀ — 5 58	
30	06	06	☌ ☿ ☽ . . . . ☿ — 7 14	
30	19	—	☿ Greatest Hel. Lat. S.	

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude. From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Abastuman . . .	+ 41 42 24	− 11 35.5	9.999 351	− 7 59 41	− 2 51 25
Åbo . . .	+ 60 26 56.8	− 10 02.1	9.998 887	− 6 37 22.20	− 1 29 06.42
Adelaide . . .	− 34 55 38.5	+ 10 56.8	9.999 520	+ 9 37 23.92	− 9 14 20.30
Albany (*New Obs.*) .	+ 42 39 12.7	− 11 38.0	9.999 326	− 0 13 09.0	+ 4 55 06.8
Albany (*Old Obs.*) .	+ 42 39 49.5	− 11 38.0	9.999 326	− 0 13 15.79	+ 4 54 59.99
Alfred (*N. Y.*) . .	+ 42 15 19.8	− 11 37.0	9.999 337	+ 0 02 51.37	+ 5 11 07.15
Algiers (*Old Obs.*) .	+ 36 44 00	− 11 10.8	9.999 476	− 5 20 32.6	− 0 12 16.8
Algiers (*New Obs.*) .	+ 36 47 50	− 11 11.3	9.999 474	− 5 20 24.33	− 0 12 08.55
Allegheny . . .	+ 40 27 41.6	− 11 31.3	9.999 383	+ 0 11 47.15	+ 5 20 02.93
Altona . . .	+ 53 32 45.3	− 11 10.2	9.999 049	− 5 48 02.02	− 0 39 46.24
Amherst . . .	+ 42 22 17.1	− 11 37.3	9.999 334	− 0 18 11.11	+ 4 50 04.67
Annapolis . . .	+ 38 58 53.5	− 11 24.5	9.999 420	− 0 02 19.29	+ 5 05 56.49
Ann Arbor . . .	+ 42 16 48.0	− 11 37.0	9.999 336	+ 0 26 39.41	+ 5 34 55.19
Arequipa (*Harvard*) .	− 16 24	+ 6 18.4	9.999 884	− 0 22 46	+ 4 45 30
Armagh . . .	+ 54 21 12.7	− 11 04.2	9.999 029	− 4 41 40.4	+ 0 26 35.4
Athens . . .	+ 37 58 20.7	− 11 18.9	9.999 445	− 6 43 08.70	− 1 34 52.92
Bamberg . . .	+ 49 53 06.0	− 11 30.7	9.999 141	− 5 51 49.43	− 0 43 33.65
Beloit . . .	+ 42 30 08.4	− 11 37.6	9.999 331	+ 0 47 51.5	+ 5 56 07.3
Bergen . . .	+ 60 23 54	− 10 02.7	9.998 888	− 5 29 28.53	− 0 21 12.75
Berkeley . . .	+ 37 52 23.6	− 11 18.3	9.999 448	+ 3 00 46.94	+ 8 09 02.72
Berlin . . .	+ 52 30 16.7	− 11 17.1	9.999 075	− 6 01 50.63	− 0 53 34.85
Berlin (*Urania*) .	+ 52 31 30.7	− 11 17.0	9.999 075	− 6 01 43.23	− 0 53 27.45
Berne . . .	+ 46 57 08.7	− 11 39.0	9.999 216	− 5 38 01.51	− 0 29 45.73
Besançon . . .	+ 47 14 59.0	− 11 38.5	9.999 208	− 5 32 12.95	− 0 23 57.17
Bethlehem . . .	+ 40 36 23.1	− 11 31.9	9.999 379	− 0 06 43.93	+ 5 01 31.85
Birr Castle . . .	+ 53 05 47.0	− 11 13.3	9.999 060	− 4 36 34.9	+ 0 31 40.9
Bogota . . .	+ 4 36 15.4	− 1 51.5	9.999 991	− 0 11 21.58	+ 4 56 54.20
Bologna . . .	+ 44 29 54	− 11 40.3	9.999 279	− 5 53 40.7	− 0 45 24.9
Bombay . . .	+ 18 53 45	− 7 08.1	9.999 847	− 9 59 31.52	− 4 51 15.74
Bonn . . .	+ 50 43 45.0	− 11 26.9	9.999 120	− 5 36 39.00	− 0 28 23.22
Bordeaux . . .	+ 44 50 07.2	− 11 40.4	9.999 271	− 5 06 10.24	+ 0 02 05.54
Boston (*University*) .	+ 42 21 32.5	− 11 37.2	9.999 334	− 0 24 00.8	+ 4 44 15.0
Bothkamp . . .	+ 54 12 09.6	− 11 05.3	9.999 033	− 5 48 47.0	− 0 40 31.2
Breslau . . .	+ 51 06 55.8	− 11 25.0	9.999 110	− 6 16 24.57	− 1 08 08.79
Brisbane . . .	− 27 28 00.0	+ 9 32.2	9.999 689	+ 8 39 37.82	− 10 12 06.40
Brussels (*Uccle*) .	+ 50 47 53	− 11 26.6	9.999 118	− 5 25 42.7	− 0 17 26.9
Brussels (*Old Obs.*) .	+ 50 51 10.7	− 11 26.3	9.999 117	− 5 25 44.51	− 0 17 28.73
Budapest . . .	+ 47 29 34.7	− 11 38.0	9.999 202	− 6 24 31.1	− 1 16 15.3
Cairo . . .	+ 30 04 38.2	− 10 06.5	9.999 632	− 7 13 24.69	− 2 05 08.91
Cambridge (*England*) .	+ 52 12 51.6	− 11 18.9	9.999 082	− 5 08 38.53	− 0 00 22.75
Cambridge (*Mass.*) .	+ 42 22 47.6	− 11 37.3	9.999 334	− 0 23 44.73	+ 4 44 31.05
Cape of Good Hope .	− 33 56 03.6	+ 10 48.0	9.999 543	− 6 22 10.54	− 1 13 54.76
Catania . . .	+ 37 30 13.3	− 11 16.0	9.999 457	− 6 08 36	− 1 00 20
Chapultepec . . .	+ 19 25 17.5	− 7 18.2	9.999 838	+ 1 28 22.52	+ 6 36 38.30
Charkow . . .	+ 50 00 09.6	− 11 30.2	9.999 138	− 7 33 11.55	− 2 24 55.77

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Charlottesville	+ 38 02 01.2	− 11 19.3	9.999 444	+ 0 05 49.44	+ 5 14 05.22
Chicago (*Old Obs.*)	+ 41 50 01.0	− 11 35.9	9.999 348	+ 0 42 11.06	+ 5 50 26.84
Christiania	+ 59 54 44.0	− 10 08.7	9.998 899	− 5 51 09 30	− 0 42 53.52
Cincinnati (*New Obs.*)	+ 39 08 19.5	− 11 25.4	9.999 416	+ 0 29 25.62	+ 5 37 41.40
Cincinnati (*Old Obs.*)	+ 39 06 26.5	− 11 25.2	9.999 417	+ 0 29 43.22	+ 5 37 59.00
Clinton	+ 43 03 17.0	− 11 38.7	9.999 316	− 0 06 38.33	+ 5 01 37.45
Coimbra	+ 40 12 24.5	− 11 30.3	9.999 389	− 4 34 32.7	+ 0 33 43.1
Columbia (*Missouri*)	+ 38 56 51.7	− 11 24.4	9.999 421	+ 1 01 02.55	+ 6 09 18.33
Copenhagen	+ 55 41 12.9	− 10 53.1	9.998 997	− 5 58 34.48	− 0 50 18.70
Cordoba	− 31 25 15.2	+ 10 22.2	9.999 602	− 0 51 27.56	+ 4 16 48.22
Cracow	+ 50 03 52.0	− 11 29.9	9.999 137	− 6 28 06.06	− 1 19 50.28
Crowborough	+ 51 03 14	− 11 25.4	9.999 112	− 5 08 54	− 0 00 38
Dantzig	+ 54 21 18.0	− 11 04.1	9.999 029	− 6 22 55.4	− 1 14 39.6
Denver	+ 39 40 36.4	− 11 27.9	9.999 402	+ 1 51 31.85	+ 6 59 47.63
Dorpat	+ 58 22 47.1	− 10 26.4	9.998 934	− 6 55 09.07	− 1 46 53.29
Dresden	+ 51 02 16.8	− 11 25.4	9.999 112	− 6 03 10.63	− 0 54 54.85
Dublin	+ 53 23 13.1	− 11 11.3	9.999 053	− 4 42 54.7	+ 0 25 21.1
Dun Echt	+ 57 09 36	− 10 39.2	9.998 962	− 4 58 35.8	+ 0 09 40.0
Durham	+ 54 46 06.2	− 11 00.9	9.999 019	− 5 01 56.03	+ 0 06 19.75
Düsseldorf	+ 51 12 25.0	− 11 24.6	9.999 108	− 5 35 20.8	− 0 27 05.0
Edinburgh (*Calton Hill*)	+ 55 57 23.2	− 10 50.7	9.998 991	− 4 55 32.7	+ 0 12 43.1
Edinburgh (*Royal Obs.*)	+ 55 55 28.0	− 10 50.9	9.998 991	− 4 55 31.6	+ 0 12 44.2
Evanston (*Dearborn*)	+ 42 03 33.4	− 11 36.5	9.999 342	+ 0 42 26.5	+ 5 50 42.3
Florence (*Reale Museo*)	+ 43 46 04.1	− 11 39.7	9.999 298	− 5 53 17.3	− 0 45 01.5
Florence (*Arcetri*)	+ 43 45 14.6	− 11 39.7	9.999 298	− 5 53 17.12	− 0 45 01.34
Geneva	+ 46 11 58.8	− 11 39.9	9.999 236	− 5 32 52.49	− 0 24 36.71
Genoa	+ 44 25 09.3	− 11 40.2	9.999 281	− 5 43 57.11	− 0 35 41.33
Georgetown	+ 38 54 26.7	− 11 24.2	9.999 422	+ 0 00 02.48	+ 5 08 18.26
Glasgow (*Missouri*)	+ 39 13 45.6	− 11 25.8	9.999 414	+ 1 03 02.30	+ 6 11 18.08
Glasgow (*Scotland*)	+ 55 52 42.8	− 10 51.5	9.998 993	− 4 51 05.23	+ 0 17 10.55
Gohlis	+ 51 21 35.0	− 11 23.7	9.999 104	− 5 57 45.43	− 0 49 29.65
Gotha (*Old Obs.*)	+ 50 56 05.2	− 11 26.0	9.999 114	− 5 51 10.88	− 0 42 55.10
Gotha	+ 50 56 37.9	− 11 25.9	9.999 114	− 5 51 06.27	− 0 42 50.49
Göttingen	+ 51 31 47.9	− 11 22.8	9.999 100	− 5 48 02.07	− 0 39 46.29
Graz	+ 47 04 37.2	− 11 38.8	9.999 213	− 6 10 04	− 1 01 48
Greenwich	+ 51 28 38.1	− 11 23.1	9.999 101	− 5 08 15.78	0 00 00 00
Grignon	+ 47 33 42	− 11 37.8	9.999 201	− 5 25 54	− 0 17 38
Hamburg	+ 53 33 07.0	− 11 10.1	9.999 049	− 5 48 09.6	− 0 39 53.8
Hanover	+ 43 42 15.3	− 11 39.6	9.999 300	− 0 19 07.87	+ 4 49 07.91
Harrow	+ 51 34 47.1	− 11 22.6	9.999 098	− 5 06 55.92	+ 0 01 19.86
Hastings-on-Hudson	+ 40 59 25	− 11 33.2	9.999 369	− 0 12 46.33	+ 4 55 29.45
Haverford	+ 40 00 40.1	− 11 29.4	9.999 394	− 0 07 03.08	+ 5 01 12.70
Heidelberg	+ 49 24 35	− 11 32.5	9.999 153	− 5 43 04.3	− 0 34 48.5
Helsingfors	+ 60 09 42.6	− 10 05.6	9.998 893	− 6 48 04.93	− 1 39 49.15
Hereny	+ 47 15 47.4	− 11 38.4	9.999 208	− 6 14 40.5	− 1 06 24.7

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude. From Washington.	Longitude. From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Hongkong . . .	+22 18 13.4	− 8 10.7	9.999 789	+11 15 02.36	− 7 36 41.86
Hudson . . .	+41 14 42.6	− 11 34.1	9.999 363	+ 0 17 25.5	+ 5 25 41.3
Jamaica . . .	+18 24 51	− 6 58.7	9.999 854	+ 0 03 13.70	+ 5 11 29.48
Jena (*University*) .	+50 55 34.9	− 11 26.0	9.999 115	− 5 54 36.05	− 0 46 20.27
Kalocsa . .	+46 31 41.7	− 11 39.6	9.999 227	− 6 24 10.12	−· 1 15 54.34
Karlsruhe . .	+49 00 29.6	− 11 33.9	9.999 163	−· 5 41 52.2	− 0 33 36.4
Kasan . . .	+55 47 24.4	− 10 52.2	9.998 995	− 8 24 44.82	− 3 16 29.04
Kew . . .	+51 28 06	− 11 23.2	9.999 101	− 5 07 00.7	+ 0 01 15.1
Kiel . . .	+54 20 28.5	− 11 04.2	9.999 030	− 5 48 51.42	− 0 40 35.64
Kiew . . .	+50 27 10.5	− 11 28.2	9.999 127	− 7 10 16.42	− 2 02 00.64
Kis Kartal . .	+47 41 54.8	− 11 37.5	9.999 197	−· 6 26 27.5	− 1 18 11.7
Königsberg . .	+54 42 50.4	− 11 01.3	9.999 021	− 6 30 14.82	− 1 21 59.04
Kremsmünster .	+48 03 23.1	− 11 36.7	9.999 188	− 6 04 47.37	− 0 56 31.59
La Plata . .	−34 54 30.3	+ 10 56.7	9.999 520	− 1 16 38.8	+ 3 51 37.0
Leiden . . .	+52 09 20.0	−· 11 19.3	9.999 084	− 5 26 11.95	·− 0 17 56.17
Leipzig . . .	+51 20 05.9	− 11 23.9	9.999 104	− 5 57 49.76	0 49 33.98
Liege (*Cointe, Ougrée*) .	+50 37 07	− 11 27.5	9.999 123	− 5 30 31.0	− 0 22 15.2
Lisbon (*Marine Obs.*) .	+38 42 17.6	− 11 23.3	9.999 427	− 4 31 42.20	+ 0 36 33.58
Lisbon (*Royal Obs.*) .	+38 42 31.3	− 11 23.1	9.999 427	− 4 31 31.10	+ 0 36 44.68
Liverpool . .	+53 24 04.8	− 11 11.2	9.999 053	− 4 55 58.45	+ 0 12 17.33
Lübec . . .	+53 51 31.1	− 11 07.9	9.999 042	− 5 51 01.5	− 0 42 45.7
Lund . . .	+55 41 51.6	− 10 53.0	9.998 997	− 6 01 00.79	− 0 52 45.01
Lussinpiccolo (*Manora*)	+44 32 11.0	− 11 40.3	9.999 278	− 6 06 08.19	−· 0 57 52.41
Lyons . . .	+45 41 41.0	− 11 40.3	9.999 248	− 5 27 24.33	− 0 19 08.55
Madison . . .	+43 04 36.8	− 11 38.7	9.999 316	+ 0 49 22.15	+ 5 57 37.93
Madras . . .	+13 04 08.0	− 5 07.6	9.999 925	−10 29 14.90	− 5 20 59.12
Madrid . . .	+40 24 29.7	− 11 31.1	9.999 384	−· 4 53 30.66	+ 0 14 45.12
Manila . . .	+14 35 25	−· 5 40.5	9.999 907	+10 47 54	8 03 50
Mannheim . .	+49 29 11.0	− 11 32.2	9.999 151	5 42 06.23	0 33 50.45
Marburg . . .	+50 48 46.9	− 11 26.5	9.999 118	·− 5 43 20.7	0 35 04.9
Markree . . .	+54 10 31.8	− 11 05.5	9.999 034	−· 4 34 27.4	+ 0 33 48.4
Marseilles . .	+43 18 17.5	−· 11 39.1	9.999 310	− 5 29 50.37	0 21 34.59
Mauritius . .	−20 05 39	+ 7 30.8	9.999 828	− 8 58 28.4	· 3 50 12.6
Melbourne . .	− 37 49 53.4	+ 11 18.1	9.999 449	+ 9 11 50.2	− 9 39 54.0
Meudon . . .	+48 48 18	− 11 34.6	9.999 169	− 5 17 11.4	− 0 08 55.6
Mexico . . .	+19 26 01 3	− 7 18.4	9.999 838	+ 1 28 10.95	+ 6 36 26.73
Middletown (*Conn.*) .	+41 33 16.0	− 11 35.1	9.999 355	− 0 17 38.60	+ 4 50 37.18
Milan . . .	+45 27 59.3	− 11 40.4	9.999 254	− 5 45 01.70	−· 0 36 45.92
Modena . . .	+44 38 52.8	− 11 40.4	9.999 275	− 5 51 58.7	0 43 42.9
Moncalieri . .	+44 59 51	− 11 40.4	9.999 266	− 5 39 05	0 30 49
Montreal . . .	+45 30 17.0	− 11 40.4	9.999 253	− 0 13 57.15	+ 4 54 18.63
Montsouris . .	+48 49 18 0	− 11 34.5	9.999 168	− 5 17 36.46	− 0 09 20.68
Moscow . . .	+55 45 19.8	− 10 52.5	9.998 995	− 7 38 32.87	− 2 30 17.09
Mount Hamilton (*Lick*)	+37 20 25.6	− 11 14.9	9.999 461	+ 2 58 19.11	+ 8 06 34.89
Munich . . .	+48 08 45.5	− 11 36.5	9.999 186	−· 5 54 41.85	− 0 46 26.07

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude. From Washington.	Longitude. From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Naples . . .	+ 40 51 46.3	− 11 32.8	9.999 372	− 6 05 17.51	− 0 57 01.73
Nashville . . .	+ 36 08 54.4	− 11 06.6	9.999 490	+ 0 38 56.4	+ 5 47 12.2
Natal . . .	− 29 50 46.6	+ 10 03.7	9.999 637	− 7 12 16.96	− 2 04 01.18
Neuchatel . . .	+ 47 00 01.2	− 11 38.9	9.999 215	− 5 36 05.71	− 0 27 49.93
New Haven (*Old Obs.*)	+ 41 18 36.5	− 11 34.3	9.999 361	− 0 16 33.64	+ 4 51 42.14
New Haven (*Yale Univ.*)	+ 41 19 22.3	− 11 34.4	9.999 361	− 0 16 35.20	+ 4 51 40.58
New York (*Columb. Coll.*)	+ 40 45 23.1	− 11 32.4	9.999 375	− 0 12 22.14	+ 4 55 53.64
New York (RUTHERFURD)	+ 40 43 48.5	− 11 32.3	9.999 376	− 0 12 19.10	+ 4 55 56.68
Nice . . .	+ 43 43 16.9	− 11 39.6	9.999 299	− 5 37 27.96	− 0 29 12.18
Nicolaeff . . .	+ 46 58 21.8	− 11 38.9	9.999 216	− 7 16 09.58	− 2 07 53.80
Northfield . . .	+ 44 27 41.6	− 11 40.3	9.999 280	+ 1 04 20.03	+ 6 12 35.81
Oakland (*Cal.*) .	+ 37 48 05	− 11 17.9	9.999 449	+ 3 00 50.77	+ 8 09 06.55
Odessa . . .	+ 46 28 36.7	− 11 39.6	9.999 228	− 7 11 17.88	− 2 03 02.10
Ogden . . .	+ 41 13 08.6	− 11 34.0	9.999 363	+ 2 19 43.85	+ 7 27 59.63
O-Gyalla . . .	+ 47 52 27.3	− 11 37.1	9.999 192	− 6 21 01.32	− 1 12 45.54
Olmütz . . .	+ 49 35 43	− 11 31.8	9.999 149	− 6 17 24	− 1 09 08
Oxford (*Mississippi*) .	+ 34 22 12.6	− 10 52.0	9.999 533	+ 0 49 51.3	+ 5 58 07.1
Oxford (*Radcliffe*) .	+ 51 45 35.4	− 11 21.6	9.999 094	− 5 03 13.2	+ 0 05 02.6
Oxford (*University*) .	+ 51 45 34.2	− 11 21.6	9.999 094	− 5 03 15.4	+ 0 05 00.4
Padua . . .	+ 45 24 05	− 11 40.4	9.999 256	− 5 55 44.97	− 0 47 29.19
Palermo . . .	+ 38 06 44.0	− 11 19.7	9.999 442	− 6 01 41.68	− 0 53 25.90
Paramatta . .	− 33 48 49.8	+ 10 46.9	9.999 546	+ 8 47 44.0	− 10 04 00.2
Paris . . .	+ 48 50 11.2	− 11 34.5	9.999 168	− 5 17 36.75	− 0 09 20.97
Philadelphia . .	+ 39 57 07.5	− 11 29.2	9.999 396	− 0 07 37.27	+ 5 00 38.51
Plonsk . . .	+ 52 37 40.0	− 11 16.4	9.999 072	− 6 29 47.8	− 1 21 32.0
Pola . . .	+ 44 51 48.7	− 11 40.4	9.999 270	− 6 03 38.67	− 0 55 22.89
Portsmouth . .	+ 50 48 03	− 11 26.6	9.999 118	− 5 03 51.0	+ 0 04 24.8
Potsdam . . .	+ 52 22 56.0	− 11 17.9	9.999 078	− 6 00 31.7	− 0 52 15.9
Poughkeepsie .	+ 41 41 18	− 11 35.5	9.999 351	− 0 12 42.13	+ 4 55 33.65
Prague (*University*) .	+ 50 05 15.8	− 11 29.8	9.999 136	− 6 05 56.1	− 0 57 40.3
Princeton . . .	+ 40 20 57.8	− 11 30.8	9.999 385	− 0 09 38.17	+ 4 58 37.61
Princeton (*Halsted*) .	+ 40 20 55.8	− 11 30.9	9.999 386	− 0 09 36.34	+ 4 58 39.44
Providence (SEAGRAVE)	+ 41 49 46.4	− 11 35.9	9.999 348	− 0 22 38.14	+ 4 45 37.64
Providence (*Ladd*) .	+ 41 50 21	− 11 35.9	9.999 348	− 0 22 39.83	+ 4 45 35.95
Pulkowa . . .	+ 59 46 18.7	− 10 10.4	9.998 902	− 7 09 34.42	− 2 01 18.64
Quebec . . .	+ 46 47 59.2	− 11 39.2	9.999 220	− 0 23 23.14	+ 4 44 52.64
Quito . . .	− 0 14 00	+ 0 05.7	0.000 000	+ 0 05 50.88	+ 5 14 06.66
Riga . . .	+ 56 57 09.3	− 10 41.3	9.998 967	− 6 44 43.95	− 1 36 28.17
Rio de Janeiro .	− 22 54 23.6	+ 8 21.1	9.999 779	− 2 15 34.4	+ 2 52 41.4
Rochester . .	+ 43 09 16.8	− 11 38.8	9.999 314	+ 0 02 06.00	+ 5 10 21.78
Rome (*Coll. Rom.*) .	+ 41 53 53.6	− 11 36.1	9.999 346	− 5 58 11.33	− 0 49 55.55
Rome (*Capitol*) .	+ 41 53 33.5	− 11 36.0	9.999 346	− 5 58 12.15	− 0 49 56.37
Rome (*Vatican*) .	+ 41 54 04.8	− 11 36.1	9.999 346	− 5 58 05.25	− 0 49 49.47
Rousdon . . .	+ 50 42 38	− 11 27.0	9.999 120	− 4 56 16.84	+ 0 11 58.94
Rugby . . .	+ 52 22 07	− 11 18.0	9.999 079	− 5 03 13.8	+ 0 05 02.0

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude. From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
San Fernando . .	+ 36 27 42.0	– 11 08.9	9.999 483	– 4 43 26.6	+ 0 24 49.2
San Francisco . .	+ 37 47 27.9	– 11 17.8	9.999 450	+ 3 01 27.08	+ 8 09 42.86
Santiago de Chile .	– 33 26 42.0	+ 10 43.4	9.999 555	– 0 25 29.56	+ 4 42 46.22
South Hadley . .	+ 42 15 18.2	– 11 37.0	9.999 337	– 0 17 55.49	+ 4 50 20.29
Speier . . .	+ 49 18 55.2	– 11 32.9	9.999 156	– 5 42 01.34	– 0 33 45.56
St. Louis . . .	+ 38 38 03.0	– 11 22.7	9.999 429	+ 0 52 33.48	+ 6 00 49.26
St. Petersburg (*Academy*)	+ 59 56 29.7	– 10 08.4	9.998 898	– 7 09 29.24	– 2 01 13.46
St. Petersburg (*Univ.*)	+ 59 56 32.0	– 10 08.4	9.998 898	– 7 09 27.2	– 2 01 11.4
Stockholm . . .	+ 59 20 33.0	– 10 15.5	9.998 912	– 6 20 29.77	– 1 12 13.99
Stonyhurst . . .	+ 53 50 40	– 11 08.0	9.999 042	– 4 58 23.10	+ 0 09 52.68
Strassburg (*New Obs.*)	+ 48 35 00.3	– 11 35.3	9.999 174	– 5 39 20.47	– 0 31 04.69
Strassburg (*Old Obs.*) .	+ 48 34 53.8	– 11 35.3	9.999 174	– 5 39 18.27	– 0 31 02.49
Sydney . . .	– 33 51 41.1	+ 10 47.3	9.999 545	+ 8 46 54.68	–10 04 49.54
Syracuse . . .	+ 43 02 13.1	– 11 38.6	9.999 317	– 0 03 42.42	+ 5 04 33.36
Tacubaya . . .	+ 19 24 17.5	– 7 17.8	9.999 839	+ 1 28 30.75	+ 6 36 46.53
Taschkent . . .	+ 41 19 31.3	– 11 34.4	9.999 361	– 9 45 26.58	– 4 37 10.80
Tokio . . .	+ 35 39 17.5	– 11 02.8	9.999 502	+ 9 32 46.20	– 9 18 58.02
Toronto . . .	+ 43 39 35.9	– 11 39.6	9.999 301	+ 0 09 18.87	+ 5 17 34.65
Toulouse . . .	+ 43 36 45	– 11 39.5	9.999 302	– 5 14 05.66	– 0 05 49.88
Trieste . . .	+ 45 38 45.4	– 11 40.3	9.999 250	– 6 03 18.73	– 0 55 02.95
Troy (*N. Y.*) . .	+ 42 43 52.9	– 11 38.1	9.999 325	– 0 13 33.49	+ 4 54 42.29
Tulse Hill . . .	+ 51 26 47.0	– 11 23.3	9.999 102	– 5 07 48.1	+ 0 00 27.7
Turin . . .	+ 45 04 08.0	– 11 40.4	9.999 265	– 5 39 02.96	– 0 30 47.18
Tuscaloosa (*Ala. Univ.*)	+ 33 12 36.8	– 10 41.1	9.999 561	+ 0 41 55.96	+ 5 50 11.74
Twickenham . .	+ 51 27 04.2	– 11 23.3	9.999 102	– 5 07 02.7	+ 0 01 13.1
Upsala (*New Obs.*) .	+ 59 51 29.4	– 10 09.3	9.998 900	– 6 18 45.93	– 1 10 30.15
Utrecht . . .	+ 52 05 09.6	– 11 19.7	9.999 086	– 5 28 46.8	– 0 20 31.0
Venice . . .	+ 45 26 10.5	– 11 40.4	9.999 255	– 5 57 37.90	– 0 49 22.12
Vienna (*Josephstadt*) .	+ 48 12 53.8	– 11 36.2	9.999 183	– 6 13 41.1	– 1 05 25.3
Vienna (*New Obs.*) .	+ 48 13 55.4	– 11 36.2	9.999 183	– 6 13 37.17	– 1 05 21.39
Vienna (*Old Obs.*) .	+ 48 12 35.5	– 11 36.3	9.999 184	– 6 13 47.42	– 1 05 31 64
Vienna (*Ottakring*) .	+ 48 12 46.7	– 11 36.2	9.999 183	– 6 13 26.89	– 1 05 11.11
Warsaw . . .	+ 52 13 04.7	– 11 18.9	9.999 082	– 6 32 23.06	– 1 24 07.28
Washington . .	+ 38 55 14.0	– 11 24.2	9.999 422	0 00 00.00	+ 5 08 15.78
Washington (*Old Obs.*)	+ 38 53 38.8	– 11 24.1	9.999 422	– 0 00 03.63	+ 5 08 12.15
Washington (*Smithsonian*)	+ 38 53 17.3	– 11 24.1	9.999 422	– 0 00 09.6	+ 5 08 06.2
Washington (*Cath. Univ.*)	+ 38 56 14.8	– 11 24.2	9.999 422	– 0 00 15.78	+ 5 08 00.00
Wellington . . .	– 41 18 00.6	+ 11 34.3	9.999 361	+ 7 12 37.70	–11 39 06 52
West Point (*Old Obs.*)	+ 41 23 31	– 11 34.6	9.999 359	– 0 12 26.34	+ 4 55 49.44
West Point (*New Obs.*)	+ 41 23 22.1	– 11 34.6	9.999 359	– 0 12 25.23	+ 4 55 50.55
Wilhelmshaven . .	+ 53 31 52.2	– 11 10.3	9.999 050	– 5 40 50.89	– 0 32 35.11
Williamstown (*Mass.*).	+ 42 42 30	– 11 38.0	9.999 325	– 0 15 26	+ 4 52 50
Williamstown (*Victoria*)	– 37 52 07.2	+ 11 18.3	9.999 448	+ 9 12 06.1	– 9 39 38.1
Wilna . . .	+ 54 40 59.1	– 11 01.6	9.999 021	– 6 49 24.60	– 1 41 08.82
Windsor . . .	– 33 36 30.8	+ 10 44.9	9.999 551	+ 8 48 23.7	–10 03 20.5
Zürich . . .	+ 47 22 40.0	– 11 38.2	9.999 205	– 5 42 28.08	– 0 34 12.30

PART IV.

APPARENT PLACES OF STARS, STAR NUMBERS,

AND OTHER DATA,

BASED ON THE CONSTANTS OF THE

PARIS CONFERENCE OF 1896.

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FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF THE PARIS CONFERENCE, OF MAY, 1896.

NOTATION.

τ, the time reckoned in units of one year, from the beginning of the Besselian fictitious year, (1901, December $31.584^d = 1902$, January 0.584^d, Washington mean time).

a_0, δ_0, the star's mean right ascension and declination at the beginning of the fictitious year,

a, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the sun's true longitude,

L, the sun's mean longitude,

Ω, the longitude of the moon's ascending node,

ω, the obliquity of the ecliptic,

Γ', the longitude of the moon's perigee,

$\mathbb{C}$, the moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$$A = \tau - 0.342\ 16 \sin \Omega$$
$$+ 0.004\ 15 \sin 2\ \Omega$$
$$- 0.024\ 95 \sin 2\ L$$
$$+ 0.002\ 18 \sin (L + 75.3°)$$
$$- 0.000\ 97 \sin (3\ L + 78.7°)$$
$$- 0.004\ 05 \sin 2\ \mathbb{C}$$

$$+ 0.000\ 24 \sin (\mathbb{C} + \Gamma')$$
$$+ 0.001\ 33 \sin (\mathbb{C} - \Gamma')$$
$$- 0.000\ 68 \sin (2\ \mathbb{C} - \Omega)$$
$$- 0.000\ 52 \sin (3\ \mathbb{C} - \Gamma')$$
$$+ 0.000\ 30 \sin (\mathbb{C} - 2\ L + \Gamma')$$
$$+ 0.000\ 12 \sin 2\ (\mathbb{C} - L)$$

$$B = -9.210 \cos \Omega$$
$$+ 0.090 \cos 2\ \Omega$$
$$- 0.546 \cos 2\ L$$
$$- 0.021 \cos (3\ L + 78.7°)$$
$$+ 0.009 \cos (L - 78.7°)$$

$$- 0.088 \cos 2\ \mathbb{C}$$
$$- 0.018 \cos (2\ \mathbb{C} - \Omega)$$
$$- 0.011 \cos (3\ \mathbb{C} - \Gamma')$$
$$+ 0.005 \cos (\mathbb{C} + \Gamma')$$

$$C = -20.4700 \cos \omega \cos \odot$$
$$D = -20.4700 \sin \odot$$
$$E = -0.0426 \sin \Omega + 0.0005'' \sin 2\ \Omega - 0.0031'' \sin 2\ L$$

BESSEL'S *Star-Constants.*

$$a = 3.072\ 38^s + 1.336\ 45^s \sin a_0 \tan \delta_0 = \text{precession in right ascension}$$
$$b = \tfrac{1}{15} \cos a_0 \tan \delta_0$$
$$c = \tfrac{1}{15} \cos a_0 \sec \delta_0$$
$$d = \tfrac{1}{15} \sin a_0 \sec \delta_0$$
$$a' = 20.0466'' \cos a_0 = \text{precession in declination}$$
$$b' = -\sin a_0$$
$$c' = \tan \omega \cos \delta_0 - \sin a_0 \sin \delta_0$$
$$d' = \cos a_0 \sin \delta_0$$

Reduction to Apparent Position.

$$a = a_0 + \tau \mu + Aa + Bb + Cc + Dd + \tfrac{1}{15} E \qquad \text{(in time)}$$
$$\delta = \delta_0 + \tau \mu' + Aa' + Bb' + Cc' + Dd' \qquad \text{(in arc)}$$

INDEPENDENT STAR-NUMBERS.

$$f = f' + f'' = +46.0856'' A + E \text{ (in arc)} = 3.072\ 38^s A + \tfrac{1}{15} E \qquad \text{(in time)}$$
$$f'' = -0.0124^s \sin 2\ \mathbb{C} + 0.0041^s \sin (\mathbb{C} - \Gamma') + 0.0007^s \sin (\mathbb{C} + \Gamma')$$
$$- 0.0021^s \sin (2\ \mathbb{C} - \Omega) - 0.0016^s \sin (3\ \mathbb{C} - \Gamma')$$
$$+ 0.0009^s \sin (\mathbb{C} - 2\ L + \Gamma') + 0.0004^s \sin 2\ (\mathbb{C} - L)$$

$$g \sin G = B$$
$$g \cos G = 20.0466'' A$$

$$h \sin H = C$$
$$h \cos H = D$$

$$i = C \tan \omega$$

Reduction to Apparent Position.

$$a = a_0 + f + \tau \mu + \tfrac{1}{15} g \sin (G + a_0) \tan \delta_0 + \tfrac{1}{15} h \sin (H + a_0) \sec \delta_0 \text{ (in time)}$$
$$\delta = \delta_0 + \tau \mu' + g \cos (G + a_0) + h \cos (H + a_0) \sin \delta_0 + i \cos \delta_0 \qquad \text{(in arc)}$$

NOTES.—(1) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when BESSEL'S star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(2) In using the star-constants of the *British Association Catalogue*, a, b, c, d, a', b', c', d', with the star-numbers of this Ephemeris, the quantities to be formed are Ac, Bd, Ca, Db, $-Ac'$, $-Bd'$, $-Ca'$, $-Db'$.

FOR GREENWICH MEAN NOON.

Date.	Precession in Longitude from 1902.0	Nutation. In Longitude.	Nutation. In R. A.	Nutation. In Obliquity.	Obliquity of Ecliptic. (Newcomb.)	The Sun's Aberration.
	′″	″	s	″	° ′ ″	″
Jan. 0	− 0.11	+ 11.82	+ 0.723	− 7.56	23 26 59.76	− 20.81
10	+ 1.27	12.11	0.741	7.51	59.80	20.81
20	2.64	12.31	0.753	7.43	59.87	20.80
30	4.02	12.37	0.757	7.30	26 59.98	20.77
Feb. 9	5.40	12.26	0.750	7.16	27 00.11	20.74
19	+ 6.77	+ 12.01	+ 0.735	− 7.03	23 27 00.23	− 20.70
Mar. 1	8.15	11.60	0.710	6.93	00.31	20.65
11	9.52	11.10	0.679	6.88	00.35	20.59
21	10.90	10.55	0.645	6.91	00.31	20.54
31	12.27	9.99	0.611	6.98	00.23	20.48
Apr. 10	+ 13.65	+ 9.49	+ 0.580	− 7.12	23 27 00.07	− 20.42
20	15.03	9.08	0.555	7.31	26 59.87	20.36
30	16.40	8.78	0.537	7.54	59.63	20.31
May 10	17.78	8.62	0.527	7.77	59.39	20.26
20	19.15	8.59	0.525	7.99	59.15	20.22
30	+ 20.53	+ 8.70	+ 0.532	− 8.18	23 26 58.95	− 20.18
June 9	21.90	8.88	0.543	8.33	58.78	20.15
19	23.28	9.11	0.557	8.42	58.68	20.14
29	24.66	9.36	0.572	8.46	58.63	20.13
July 9	26.03	9.59	0.587	8.43	58.65	20.13
19	+ 27.41	+ 9.72	+ 0.595	− 8.36	23 26 58.70	− 20.14
29	28.78	9.76	0.597	8.25	58.80	20.16
Aug. 8	30.16	9.66	0.591	8.11	58.92	20.18
18	31.54	9.44	0.577	7.98	59.04	20.22
28	32.91	9.08	0.555	7.86	59.15	20.26
Sept. 7	+ 34.29	+ 8.62	+ 0.527	− 7.78	23 26 59.22	− 20.31
17	35.66	8.07	0.494	7.75	59.24	20.36
27	37.04	7.50	0.459	7.77	59.20	20.42
Oct. 7	38.41	6.93	0.424	7.87	59.09	20.48
17	39.79	6.45	0.395	8.02	58.93	20.54
27	+ 41.17	+ 6.07	+ 0.371	− 8.21	23 26 58.73	− 20.60
Nov. 6	42.54	5.82	0.356	8.43	58.49	20.65
16	43.92	5.73	0.350	8.66	58.25	20.70
26	45.29	5.82	0.356	8.87	58.03	20.74
Dec. 6	46.67	6.01	0.368	9.04	57.85	20.77
16	+ 48.04	+ 6.29	+ 0.385	− 9.14	23 26 57.73	− 20.80
26	49.42	6.61	0.404	9.19	57.67	20.81
36	+ 50.80	+ 6.91	+ 0.423	− 9.16	23 26 57.69	− 20.81

Mean Obliquity 1902.0   23° 27′ 07.32″ (Newcomb).

Precession for 1902 . . . .   50.2568 log = 1.70119

Precession in a Solar Day . . . .   0.1376 log = 9.13861

Precession in a Sidereal Day . . . .   0.1372 log = 9.13742

BESSELIAN STAR-NUMBERS, 1902.

(CONSTANTS OF PARIS CONFERENCE.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		Log A	Log B	Log C	Log D	Solar Day. (Sid. Hour.)		Log A	Log B	Log C	Log D
Jan.	0	+9.3722	+0.8739	−0.5080	+1.3046	Feb.	15	+9.5606	+0.8519	−1.1953	+1.0517
	1	9.3751	0.8751	0.5501	1.3032		16	9.5657	0.8531	1.2003	1.0398
	2	9.3793	0.8762	0.5884	1.3017		17	9.5705	0.8525	1.2050	1.0275
	3	9.3846	0.8774	0.6236	1.3000		18	9.5749	0.8500	1.2096	1.0147
	4	9.3909	0.8785	0.6560	1.2981		19	9.5784	0.8470	1.2140	1.0014
h (7.0)	5	+9.3974	+0.8793	−0.6859	+1.2961	h (10.0)	20	+9.5809	+0.8439	−1.2182	+0.9876
	6	9.4042	0.8797	0.7138	1.2940		21	9.5825	0.8414	1.2222	0.9731
	7	9.4113	0.8797	0.7399	1.2917		22	9.5831	0.8395	1.2261	0.9580
	8	9.4188	0.8791	0.7644	1.2892		23	9.5835	0.8384	1.2298	0.9423
	9	9.4255	0.8779	0.7874	1.2867		24	9.5839	0.8382	1.2333	0.9258
	10	+9.4316	+0.8762	−0.8091	+1.2839		25	+9.5847	+0.8388	−1.2367	+0.9085
	11	9.4369	0.8738	0.8297	1.2810		26	9.5858	0.8401	1.2399	0.8904
	12	9.4409	0.8716	0.8492	1.2779		27	9.5876	0.8420	1.2429	0.8714
	13	9.4437	0.8698	0.8678	1.2747		28	9.5900	0.8436	1.2458	0.8514
	14	9.4464	0.8691	0.8854	1.2714	Mar.	1	9.5928	0.8445	1.2485	0.8302
	15	+9.4488	+0.8692	−0.9022	+1.2678		2	+9.5958	+0.8445	−1.2511	+0.8079
	16	9.4518	0.8698	0.9183	1.2641		3	9.5990	0.8439	1.2536	0.7842
	17	9.4559	0.8710	0.9337	1.2602		4	9.6022	0.8428	1.2559	0.7590
	18	9.4615	0.8727	0.9484	1.2562		5	9.6054	0.8414	1.2580	0.7322
	19	9.4683	0.8739	0.9624	1.2519		6	9.6077	0.8395	1.2600	0.7034
h (8.0)	20	+9.4756	+0.8739	−0.9759	+1.2475	h (11.0)	7	+9.6092	+0.8370	−1.2619	+0.6725
	21	9.4829	0.8727	0.9889	1.2429		8	9.6099	0.8351	1.2636	0.6391
	22	9.4893	0.8706	1.0013	1.2382		9	9.6103	0.8338	1.2652	0.6028
	23	9.4948	0.8681	1.0133	1.2332		10	9.6107	0.8338	1.2666	0.5631
	24	9.4991	0.8657	1.0248	1.2280		11	9.6109	0.8351	1.2679	0.5192
	25	+9.5021	+0.8633	−1.0359	+1.2227		12	+9.6115	+0.8370	−1.2691	+0.4703
	26	9.5039	0.8609	1.0465	1.2171		13	9.6133	0.8388	1.2701	0.4150
	27	9.5055	0.8594	1.0568	1.2113		14	9.6162	0.8404	1.2710	0.3515
	28	9.5073	0.8597	1.0667	1.2053		15	9.6195	0.8420	1.2718	0.2771
	29	9.5094	0.8609	1.0763	1.1991		16	9.6234	0.8428	1.2724	0.1870
	30	+9.5119	+0.8621	−1.0855	+1.1927		17	+9.6272	+0.8423	−1.2729	+0.0733
	31	9.5149	0.8628	1.0943	1.1860		18	9.6304	0.8407	1.2733	9.9187
Feb.	1	9.5187	0.8627	1.1029	1.1791		19	9.6324	0.8388	1.2735	9.6761
	2	9.5234	0.8627	1.1112	1.1719		20	9.6337	0.8370	1.2736	+9.0786
	3	9.5282	0.8625	1.1191	1.1645		21	9.6343	0.8356	1.2736	−9.3739
h (9.0)	4	+9.5330	+0.8615	−1.1268	+1.1569	h (12.0)	22	+9.6345	+0.8351	−1.2735	−9.7701
	5	9.5374	0.8597	1.1342	1.1489		23	9.6344	0.8357	1.2732	9.9745
	6	9.5411	0.8573	1.1414	1.1407		24	9.6346	0.8370	1.2728	0.1128
	7	9.5443	0.8549	1.1483	1.1321		25	9.6351	0.8395	1.2722	0.2173
	8	9.5470	0.8526	1.1550	1.1233		26	9.6361	0.8417	1.2716	0.3014
	9	+9.5488	+0.8506	−1.1614	+1.1141		27	+9.6378	+0.8439	−1.2708	−0.3716
	10	9.5498	0.8490	1.1676	1.1047		28	9.6402	0.8457	1.2698	0.4318
	11	9.5504	0.8482	1.1736	1.0948		29	9.6427	0.8470	1.2688	0.4847
	12	9.5516	0.8482	1.1793	1.0846		30	9.6452	0.8482	1.2676	0.5315
	13	9.5535	0.8492	1.1849	1.0740		31	9.6477	0.8488	1.2662	0.5737
	14	+9.5565	+0.8506	−1.1902	+1.0630	Apr.	1	+9.6503	+0.8482	−1.2648	−0.6122
	15	+9.5606	+0.8519	−1.1953	+1.0517		2	+9.6526	+0.8476	−1.2632	−0.6472

$$E = +0.03'' = +0.002^s$$

(CONSTANTS OF PARIS CONFERENCE.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Apr. 1	+ 9.6503	+ 0.8482	− 1.2648	− 0.6122	May 17	+ 9.7370	+ 0.8976	− 1.0175	− 1.2313
2	9.6526	0.8476	1.2632	0.6472	18	9.7381	0.8993	1.0064	1.2361
3	9.6543	0.8463	1.2615	0.6796	19	9.7397	0.9015	0.9948	1.2407
4	9.6554	0.8451	1.2596	0.7095	20	9.7416	0.9042	0.9828	1.2451
5	9.6559	0.8445	1.2576	0.7374	21	9.7439	0.9065	0.9703	1.2494
h (13.0) 6	+ 9.6561	+ 0.8457	− 1.2555	− 0.7634	h (16.0) 22	+ 9.7467	+ 0.9085	− 0.9574	− 1.2535
7	9.6566	0.8476	1.2532	0.7879	23	9.7495	0.9101	0.9439	1.2574
8	9.6574	0.8500	1.2508	0.8109	24	9.7523	0.9112	0.9299	1.2612
9	9.6586	0.8528	1.2482	0.8326	25	9.7552	0.9117	0.9152	1.2648
10	9.6609	0.8561	1.2456	0.8532	26	9.7580	0.9117	0.9000	1.2683
11	+ 9.6640	+ 0.8591	− 1.2427	− 0.8726	27	+ 9.7605	+ 0.9117	− 0.8841	− 1.2716
12	9.6679	0.8609	1.2397	0.8912	28	9.7626	0.9112	0.8674	1.2748
13	9.6718	0.8609	1.2366	0.9088	29	9.7643	0.9105	0.8499	1.2778
14	9.6750	0.8603	1.2333	0.9256	30	9.7656	0.9106	0.8317	1.2807
15	9.6775	0.8595	1.2299	0.9417	31	9.7668	0.9117	0.8125	1.2835
16	+ 9.6791	+ 0.8585	− 1.2263	− 0.9570	June 1	+ 9.7681	+ 0.9133	− 0.7922	− 1.2861
17	9.6801	0.8579	1.2226	0.9717	2	9.7697	0.9154	0.7709	1.2885
18	9.6806	0.8585	1.2187	0.9858	3	9.7721	0.9180	0.7484	1.2909
19	9.6809	0.8597	1.2147	0.9993	4	9.7750	0.9206	0.7244	1.2931
20	9.6814	0.8615	1.2104	1.0123	5	9.7785	0.9222	0.6990	1.2951
h (14.0) 21	+ 9.6819	+ 0.8645	− 1.2061	− 1.0247	h (17.0) 6	+ 9.7824	+ 0.9232	− 0.6719	− 1.2971
22	9.6831	0.8681	1.2015	1.0368	7	9.7861	0.9232	0.6428	1.2989
23	9.6851	0.8710	1.1968	1.0483	8	9.7894	0.9227	0.6115	1.3006
24	9.6872	0.8733	1.1919	1.0594	9	9.7922	0.9217	0.5777	1.3021
25	9.6898	0.8751	1.1868	1.0701	10	9.7942	0.9201	0.5409	1.3035
26	+ 9.6926	+ 0.8768	− 1.1815	− 1.0805	11	+ 9.7958	+ 0.9191	− 0.5005	− 1.3049
27	9.6954	0.8779	1.1761	1.0904	12	9.7971	0.9189	0.4559	1.3060
28	9.6982	0.8785	1.1705	1.1000	13	9.7980	0.9196	0.4061	1.3071
29	9.7009	0.8785	1.1646	1.1093	14	9.7992	0.9212	0.3496	1.3080
30	9.7030	0.8779	1.1586	1.1182	15	9.8007	0.9232	0.2846	1.3088
May 1	+ 9.7044	+ 0.8774	− 1.1523	− 1.1269	16	+ 9.8026	+ 0.9253	− 0.2080	− 1.3095
2	9.7054	0.8779	1.1458	1.1352	17	9.8048	0.9272	0.1147	1.3101
3	9.7064	0.8788	1.1391	1.1433	18	9.8075	0.9284	9.9957	1.3105
4	9.7071	0.8802	1.1322	1.1511	19	9.8102	0.9289	9.8311	1.3108
5	9.7081	0.8825	1.1251	1.1586	20	9.8129	0.9291	9.5626	1.3110
h (15.0) 6	+ 9.7097	+ 0.8854	− 1.1177	− 1.1659	h (18.0) 21	+ 9.8157	+ 0.9289	− 8.7207	− 1.3111
7	9.7122	0.8893	1.1100	1.1729	22	9.8183	0.9284	+ 9.4153	1.3111
8	9.7155	0.8927	1.1021	1.1797	23	9.8206	0.9270	9.7579	1.3109
9	9.7191	0.8943	1.0940	1.1863	24	9.8226	0.9258	9.9469	1.3106
10	9.7230	0.8954	1.0855	1.1926	25	9.8243	0.9248	0.0781	1.3102
11	+ 9.7268	+ 0.8957	− 1.0768	− 1.1988	26	+ 9.8256	+ 0.9238	+ 0.1786	− 1.3097
12	9.7300	0.8954	1.0677	1.2047	27	9.8268	0.9232	0.2600	1.3091
13	9.7322	0.8949	1.0584	1.2104	28	9.8279	0.9240	0.3285	1.3083
14	9.7340	0.8943	1.0487	1.2159	29	9.8293	0.9255	0.3875	1.3074
15	9.7352	0.8943	1.0387	1.2212	30	9.8311	0.9270	0.4394	1.3064
16	+ 9.7359	+ 0.8954	− 1.0283	− 1.2264	July 1	+ 9.8332	+ 0.9284	+ 0.4856	− 1.3053
17	+ 9.7370	+ 0.8976	− 1.0175	− 1.2313	2	+ 9.8360	+ 0.9294	+ 0.5272	− 1.3040

$$E = + 0.03'' = + 0.002^s$$

(CONSTANTS OF PARIS CONFERENCE.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)		Log A.	Log B.	Log C.	Log D.
July	1	+9.8332	+0.9284	+0.4856	−1.3053	Aug.	16	+9.9110	+0.9042	+1.1780	−1.0870
	2	9.8360	0.9294	0.5272	1.3040		17	9.9123	0.9020	1.1833	1.0770
	3	9.8394	0.9301	0.5651	1.3026		18	9.9132	0.8998	1.1885	1.0667
	4	9.8429	0.9299	0.5998	1.3011		19	9.9138	0.8982	1.1934	1.0560
	5	9.8461	0.9289	0.6319	1.2995		20	9.9142	0.8965	1.1982	1.0449
h (19.0)	6	+9.8486	+0.9273	+0.6616	−1.2978	h (22.0)	21	+9.9144	+0.8954	+1.2028	−1.0333
	7	9.8507	0.9253	0.6893	1.2959		22	9.9148	0.8954	1.2073	1.0213
	8	9.8524	0.9232	0.7153	1.2938		23	9.9153	0.8960	1.2116	1.0089
	9	9.8533	0.9222	0.7396	1.2917		24	9.9162	0.8976	1.2157	0.9959
	10	9.8540	0.9217	0.7626	1.2894		25	9.9176	0.8993	1.2197	0.9824
	11	+9.8549	+0.9222	+0.7843	−1.2870		26	+9.9194	+0.8998	+1.2235	−0.9683
	12	9.8564	0.9232	0.8048	1.2845		27	9.9215	0.8993	1.2271	0.9536
	13	9.8579	0.9243	0.8243	1.2818		28	9.9235	0.8982	1.2306	0.9383
	14	9.8597	0.9253	0.8429	1.2790		29	9.9253	0.8960	1.2340	0.9223
	15	9.8616	0.9256	0.8606	1.2760		30	9.9267	0.8938	1.2372	0.9056
	16	+9.8639	+0.9258	+0.8774	−1.2729		31	+9.9276	+0.8915	+1.2403	−0.8880
	17	9.8663	0.9258	0.8936	1.2697	Sept.	1	9.9280	0.8893	1.2432	0.8696
	18	9.8687	0.9253	0.9090	1.2663		2	9.9281	0.8882	1.2460	0.8501
	19	9.8708	0.9238	0.9238	1.2627		3	9.9281	0.8882	1.2486	0.8297
	20	9.8728	0.9222	0.9380	1.2591		4	9.9283	0.8887	1.2511	0.8081
h (20.0)	21	+9.8745	+0.9201	+0.9516	−1.2552	h (23.0)	5	+9.9288	+0.8899	+1.2535	−0.7852
	22	9.8759	0.9180	0.9647	1.2512		6	9.9295	0.8910	1.2557	0.7609
	23	9.8768	0.9165	0.9773	1.2471		7	9.9305	0.8921	1.2578	0.7350
	24	9.8774	0.9154	0.9894	1.2427		8	9.9318	0.8929	1.2598	0.7073
	25	9.8780	0.9154	1.0011	1.2382		9	9.9332	0.8932	1.2616	0.6776
	26	+9.8789	+0.9159	+1.0124	−1.2336		10	+9.9346	+0.8932	+1.2633	−0.6455
	27	9.8803	0.9170	1.0233	1.2287		11	9.9360	0.8927	1.2648	0.6108
	28	9.8818	0.9180	1.0337	1.2237		12	9.9371	0.8915	1.2663	0.5728
	29	9.8839	0.9186	1.0438	1.2185		13	9.9381	0.8899	1.2676	0.5311
	30	9.8863	0.9186	1.0536	1.2132		14	9.9390	0.8882	1.2688	0.4848
	31	+9.8889	+0.9180	+1.0631	−1.2076		15	+9.9394	+0.8869	+1.2698	−0.4327
Aug.	1	9.8916	0.9165	1.0722	1.2018		16	9.9397	0.8859	1.2707	0.3734
	2	9.8937	0.9143	1.0810	1.1959		17	9.9397	0.8854	1.2715	0.3045
	3	9.8954	0.9117	1.0895	1.1897		18	9.9397	0.8859	1.2722	0.2224
	4	9.8966	0.9096	1.0978	1.1833		19	9.9399	0.8871	1.2727	0.1207
h (21.0)	5	+9.8974	+0.9079	+1.1058	−1.1767	h (0.0)	20	+9.9404	+0.8893	+1.2732	−9.9875
	6	9.8978	0.9066	1.1135	1.1698		21	9.9413	0.8915	1.2735	9.7939
	7	9.8983	0.9063	1.1209	1.1628		22	9.9428	0.8932	1.2736	−9.4356
	8	9.8990	0.9069	1.1282	1.1555		23	9.9446	0.8943	1.2737	+8.8893
	9	9.8999	0.9074	1.1351	1.1479		24	9.9463	0.8943	1.2736	9.6312
	10	+9.9011	+0.9079	+1.1419	−1.1401		25	+9.9479	+0.8938	+1.2733	+9.8908
	11	9.9027	0.9085	1.1484	1.1320		26	9.9492	0.8921	1.2730	0.0523
	12	9.9044	0.9085	1.1548	1.1236		27	9.9501	0.8899	1.2725	0.1696
	13	9.9061	0.9079	1.1609	1.1149		28	9.9505	0.8885	1.2719	0.2619
	14	9.9079	0.9074	1.1668	1.1059		29	9.9505	0.8882	1.2712	0.3379
	15	+9.9096	+0.9063	+1.1725	−1.0966		30	+9.9505	+0.8887	+1.2703	+0.4024
	16	+9.9110	+0.9042	+1.1780	−1.0870	Oct.	1	+9.9506	+0.8899	+1.2693	+0.4585

$$E - + 0.02'' - + 0.002^e$$

(CONSTANTS OF PARIS CONFERENCE.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Oct. 1	+ 9.9506	+ 0.8899	+ 1.2693	+ 0.4585	Nov. 16	+ 9.9950	+ 0.9420	+ 1.0436	+ 1.2187
2	9.9509	0.8915	1.2682	0.5082	17	9.9969	0.9430	1.0329	1.2241
3	9.9513	0.8938	1.2669	0.5526	18	9.9991	0.9435	1.0218	1.2294
4	9.9521	0.8960	1.2655	0.5928	h 19	0.0010	0.9437	1.0103	1.2345
h (1.0) 5	9.9532	0.8976	1.2640	0.6295	(4.0) 20	0.0026	0.9435	0.9983	1.2394
6	+ 9.9545	+ 0.8987	+ 1.2624	+ 0.6632	21	+ 0.0037	+ 0.9430	+ 0.9858	+ 1.2441
7	9.9560	0.8998	1.2606	0.6944	22	0.0046	0.9427	0.9727	1.2486
8	9.9573	0.9004	1.2587	0.7234	23	0.0052	0.9430	0.9592	1.2529
9	9.9585	0.9006	1.2566	0.7505	24	0.0058	0.9440	0.9451	1.2571
10	9.9595	0.9004	1.2544	0.7759	25	0.0065	0.9455	0.9303	1.2611
11	+ 9.9604	+ 0.8998	+ 1.2520	+ 0.7998	26	+ 0.0073	+ 0.9474	+ 0.9149	+ 1.2649
12	9.9609	0.8987	1.2495	0.8223	27	0.0084	0.9494	0.8988	1.2686
13	9.9612	0.8982	1.2469	0.8436	28	0.0098	0.9518	0.8819	1.2721
14	9.9615	0.8987	1.2441	0.8638	29	0.0113	0.9538	0.8642	1.2754
15	9.9617	0.8998	1.2411	0.8830	30	0.0131	0.9552	0.8456	1.2785
16	+ 9.9620	+ 0.9020	+ 1.2380	+ 0.9012	Dec. 1	+ 0.0149	+ 0.9559	+ 0.8259	+ 1.2816
17	9.9626	0.9042	1.2347	0.9186	2	0.0165	0.9562	0.8053	1.2844
18	9.9635	0.9069	1.2313	0.9352	3	0.0181	0.9562	0.7834	1.2871
19	9.9649	0.9096	1.2277	0.9511	4	0.0196	0.9557	0.7602	1.2897
20	9.9667	0.9117	1.2240	0.9663	5	0.0209	0.9552	0.7355	1.2921
h (2.0) 21	+ 9.9686	+ 0.9130	+ 1.2201	+ 0.9809	h (5.0) 6	+ 0.0219	+ 0.9548	+ 0.7093	+ 1.2943
22	9.9704	0.9133	1.2160	0.9949	7	0.0226	0.9547	0.6811	1.2965
23	9.9718	0.9131	1.2118	1.0083	8	0.0234	0.9552	0.6509	1.2984
24	9.9729	0.9128	1.2074	1.0212	9	0.0241	0.9559	0.6183	1.3002
25	9.9737	0.9122	1.2027	1.0336	10	0.0249	0.9571	0.5828	1.3019
26	+ 9.9742	+ 0.9117	+ 1.1980	+ 1.0455	11	+ 0.0261	+ 0.9590	+ 0.5440	+ 1.3034
27	9.9743	0.9122	1.1930	1.0570	12	0.0277	0.9612	0.5012	1.3048
28	9.9745	0.9138	1.1878	1.0681	13	0.0296	0.9628	0.4536	1.3061
29	9.9750	0.9154	1.1824	1.0788	14	0.0318	0.9638	0.4001	1.3072
30	9.9757	0.9175	1.1768	1.0891	15	0.0340	0.9643	0.3387	1.3082
31	+ 9.9765	+ 0.9201	+ 1.1711	+ 1.0990	16	+ 0.0362	+ 0.9640	+ 0.2671	+ 1.3090
Nov. 1	9.9777	0.9229	1.1651	1.1086	17	0.0381	0.9628	0.1811	1.3097
2	9.9791	0.9253	1.1588	1.1179	18	0.0394	0.9614	0.0737	1.3103
3	9.9806	0.9269	1.1524	1.1268	19	0.0404	0.9602	9.9302	1.3107
h (3.0) 4	9.9821	0.9279	1.1457	1.1354	20	0.0412	0.9595	9.7142	1.3109
5	+ 9.9836	+ 0.9284	+ 1.1387	+ 1.1438	h (6.0) 21	+ 0.0418	+ 0.9595	+ 9.2651	+ 1.3111
6	9.9849	0.9289	1.1316	1.1518	22	0.0426	0.9602	− 9.1755	1.3111
7	9.9860	0.9289	1.1241	1.1596	23	0.0436	0.9614	9.6846	1.3110
8	9.9869	0.9284	1.1164	1.1671	24	0.0448	0.9628	9.9125	1.3107
9	9.9877	0.9284	1.1084	1.1744	25	0.0461	0.9643	0.0611	1.3103
10	+ 9.9883	+ 0.9289	+ 1.1001	+ 1.1814	26	+ 0.0475	+ 0.9655	− 0.1715	+ 1.3098
11	9.9888	0.9299	1.0915	1.1882	27	0.0492	0.9661	0.2593	1.3091
12	9.9894	0.9315	1.0826	1.1947	28	0.0508	0.9661	0.3322	1.3082
13	9.9902	0.9340	1.0734	1.2010	29	0.0524	0.9657	0.3945	1.3073
14	9.9914	0.9370	1.0638	1.2071	30	0.0539	0.9647	0.4489	1.3062
15	+ 9.9930	+ 0.9400	+ 1.0539	+ 1.2130	31	+ 0.0553	+ 0.9640	− 0.4971	+ 1.3049
16	+ 9.9950	+ 0.9420	+ 1.0436	+ 1.2187	32	+ 0.0566	+ 0.9633	− 0.5403	+ 1.3036

E = + 0.02″ = + 0.001ˢ

(CONSTANTS OF PARIS CONFERENCE.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	*f* In Time.	*f'* In Time.	G In Arc.	G In Time.	H In Arc.	H In Time.	Log *g*.	Log *h*.	*i*	Log *i*.
	y	s	s	° ′	h m	° ′	h m			″	
Jan. 0	−0.0002	+ 0.723	+ 0.003	57 44	3 50.9	350 55	23 23.7	+ 0.9467	+ 1.3101	− 1.40	− 0.1453
1	+0.0025	0.734	− 0.003	57 38	3 50.5	349 59	23 19.9	0.9484	1.3099	1.54	0.1874
2	0.0052	0.744	0.007	57 27	3 49.8	349 03	23 16.2	0.9504	1.3096	1.68	0.2257
3	0.0080	0.755	0.008	57 12	3 48.8	348 06	23 12.4	0.9528	1.3094	1.82	0.2609
4	0.0107	0.765	0.007	56 53	3 47.5	347 10	23 08.6	0.9555	1.3091	1.96	0.2933
h (7.0) 5	0.0135	+ 0.775	− 0.006	56 32	3 46.1	346 13	23 04.9	+ 0.9581	+ 1.3088	− 2.10	− 0.3232
6	0.0162	0.785	0.004	56 09	3 44.6	345 16	23 01.1	0.9604	1.3085	2.24	0.3511
7	0.0189	0.796	− 0.001	55 43	3 42.9	344 19	22 57.3	0.9626	1.3082	2.38	0.3772
8	0.0217	0.806	+ 0.003	55 13	3 40.9	343 22	22 53.5	0.9646	1.3078	2.52	0.4017
9	0.0244	0.816	0.005	54 44	3 38.9	342 25	22 49.7	0.9660	1.3074	2.66	0.4247
10	0.0271	+ 0.826	+ 0.007	54 15	3 37.0	341 28	22 45.9	+ 0.9669	+ 1.3070	− 2.80	− 0.4464
11	0.0299	0.836	0.007	53 46	3 35.0	340 31	22 42.1	0.9672	1.3066	2.93	0.4670
12	0.0326	0.845	+ 0.005	53 22	3 33.5	339 34	22 38.3	0.9672	1.3062	3.07	0.4865
13	0.0354	0.855	0.000	53 05	3 32.3	338 36	22 34.4	0.9670	1.3057	3.20	0.5051
14	0.0381	0.864	− 0.004	52 52	3 31.5	337 39	22 30.6	0.9672	1.3053	3.33	0.5227
15	0.0408	+ 0.874	− 0.009	52 43	3 30.9	336 41	22 26.7	+ 0.9685	+ 1.3048	− 3.46	− 0.5396
16	0.0436	0.883	0.012	52 34	3 30.3	335 43	22 22.9	0.9700	1.3043	3.59	0.5556
17	0.0463	0.893	0.012	52 23	3 29.5	334 46	22 19.0	0.9724	1.3038	3.72	0.5710
18	0.0490	0.902	0.010	52 08	3 28.5	333 48	22 15.2	0.9754	1.3033	3.85	0.5857
19	0.0518	0.912	− 0.006	51 46	3 27.1	332 49	22 11.3	0.9786	1.3028	3.98	0.5997
h (8.0) 20	0.0545	+ 0.921	0.000	51 18	3 25.2	331 51	22 07.4	+ 0.9816	+ 1.3022	− 4.10	− 0.6132
21	0.0573	0.930	+ 0.006	50 45	3 23.0	330 53	22 03.5	0.9839	1.3016	4.23	0.6262
22	0.0600	0.939	0.011	50 12	3 20.8	329 54	21 59.6	0.9853	1.3011	4.35	0.6386
23	0.0627	0.948	0.014	49 41	3 18.7	328 55	21 55.7	0.9861	1.3005	4.47	0.6506
24	0.0655	0.957	0.013	49 15	3 17.0	327 56	21 51.8	0.9863	1.2999	4.59	0.6621
25	0.0682	+ 0.966	+ 0.012	48 54	3 15.6	326 57	21 47.8	+ 0.9862	+ 1.2993	− 4.71	− 0.6732
26	0.0709	0.975	0.007	48 37	3 14.5	325 58	21 43.9	0.9857	1.2987	4.83	0.6838
27	0.0737	0.983	+ 0.003	48 26	3 13.7	324 59	21 39.9	0.9853	1.2981	4.94	0.6941
28	0.0764	0.992	− 0.002	48 19	3 13.3	324 00	21 36.0	0.9865	1.2974	5.06	0.7040
29	0.0792	1.000	0.006	48 15	3 13.0	323 00	21 32.0	0.9881	1.2968	5.17	0.7136
30	0.0819	+ 1.008	− 0.008	48 09	3 12.6	322 00	21 28.0	+ 0.9900	+ 1.2962	− 5.28	− 0.7228
31	0.0846	1.016	0.009	47 59	3 11.9	321 00	21 24.0	0.9911	1.2955	5.39	0.7316
Feb. 1	0.0874	1.024	0.008	47 46	3 11.1	320 00	21 20.0	0.9932	1.2949	5.50	0.7402
2	0.0901	1.032	0.005	47 30	3 10.0	319 00	21 16.0	0.9954	1.2942	5.60	0.7485
3	0.0929	1.040	− 0.002	47 09	3 08.6	317 59	21 12.0	0.9973	1.2935	5.71	0.7564
h (9.0) 4	0.0956	+ 1.048	+ 0.002	46 45	3 07.0	316 59	21 07.9	+ 0.9992	+ 1.2929	− 5.81	− 0.7641
5	0.0983	1.055	0.005	46 20	3 05.3	315 58	21 03.9	1.0003	1.2922	5.91	0.7715
6	0.1011	1.063	0.007	45 56	3 03.7	314 57	20 59.8	1.0008	1.2916	6.01	0.7787
7	0.1038	1.070	0.008	45 34	3 02.3	313 56	20 55.7	1.0012	1.2909	6.10	0.7856
8	0.1065	1.078	0.006	45 15	3 01.0	312 55	20 51.6	1.0012	1.2902	6.20	0.7923
9	0.1093	+ 1.085	+ 0.003	44 59	2 59.9	311 53	20 47.6	+ 1.0010	+ 1.2896	− 6.29	− 0.7987
10	0.1120	1.092	− 0.002	44 48	2 59.2	310 52	20 43.5	1.0008	1.2889	6.38	0.8049
11	0.1148	1.099	0.007	44 43	2 58.9	309 50	20 39.3	1.0008	1.2882	6.47	0.8109
12	0.1175	1.106	0.011	44 39	2 58.6	308 48	20 35.2	1.0015	1.2876	6.56	0.8166
13	0.1202	1.113	0.012	44 33	2 58.2	307 46	20 31.1	1.0028	1.2870	6.64	0.8222
14	0.1230	+ 1.120	− 0.011	44 28	2 57.9	306 44	20 26.9	+ 1.0050	+ 1.2863	− 6.72	− 0.8275
15	0.1257	+ 1.126	− 0.007	44 18	2 57.2	305 41	20 22.8	+ 1.0079	+ 1.2857	− 6.80	− 0.8326

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f' In Time.	f'' In Time.	G In Arc.	G In Time.	H In Arc.	H In Time.	Log g.	Log h.	i	Log i.
		y	s	s	° ′	h m	° ′	h m			″	
Feb.	15	0.1257	+ 1.126	− 0.007	44 18	2 57.2	305 41	20 22.8	+ 1.0079	+ 1.2857	− 6.80	− 0.8326
	16	0.1284	1.133	− 0.001	44 02	2 56.1	304 39	20 18.6	1.0110	1.2851	6.88	0.8376
	17	0.1312	1.140	+ 0.005	43 41	2 54.7	303 36	20 14.4	1.0133	1.2845	6.96	0.8423
h	18	0.1339	1.146	0.010	43 16	2 53.1	302 33	20 10.2	1.0144	1.2839	7.03	0.8469
(10.0)	19	0.1367	1.153	0.013	42 49	2 51.3	301 30	20 06.0	1.0148	1.2833	7.10	0.8513
	20	0.1394	+ 1.159	+ 0.014	42 26	2 49.7	300 27	20 01.8	+ 1.0148	+ 1.2827	− 7.17	− 0.8555
	21	0.1421	1.165	0.012	42 10	2 48.7	299 24	19 57.6	1.0146	1.2821	7.24	0.8595
	22	0.1449	1.172	0.008	42 00	2 48.0	298 21	19 53.4	1.0140	1.2816	7.30	0.8634
	23	0.1476	1.178	+ 0.003	41 53	2 47.5	297 17	19 49.1	1.0136	1.2810	7.36	0.8671
	24	0.1503	1.184	− 0.002	41 50	2 47.4	296 13	19 44.9	1.0139	1.2805	7.42	0.8706
	25	0.1531	+ 1.190	− 0.006	41 51	2 47.4	295 10	19 40.6	+ 1.0146	+ 1.2800	− 7.48	− 0.8740
	26	0.1558	1.196	0.008	41 52	2 47.5	294 06	19 36.4	1.0158	1.2795	7.54	0.8772
	27	0.1586	1.202	0.009	41 52	2 47.5	293 02	19 32.1	1.0176	1.2790	7.59	0.8802
	28	0.1613	1.207	0.008	41 49	2 47.2	291 58	19 27.9	1.0195	1.2785	7.64	0.8831
Mar.	1	0.1640	1.213	0.007	41 41	2 46.7	290 53	19 23.6	1.0216	1.2781	7.69	0.8858
	2	0.1668	+ 1.218	− 0.004	41 30	2 46.0	289 49	19 19.3	+ 1.0233	+ 1.2776	− 7.73	− 0.8884
	3	0.1695	1.224	0.000	41 15	2 45.0	288 45	19 15.0	1.0249	1.2772	7.78	0.8909
	4	0.1723	1.229	+ 0.003	40 57	2 43.8	287 40	19 10.7	1.0263	1.2768	7.82	0.8932
	5	0.1750	1.234	0.006	40 40	2 42.7	286 36	19 06.4	1.0274	1.2765	7.86	0.8953
h	6	0.1777	1.240	0.007	40 23	2 41.5	285 31	19 02.1	1.0279	1.2761	7.89	0.8973
(11.0)	7	0.1805	+ 1.245	+ 0.007	40 08	2 40.5	284 26	18 57.7	+ 1.0278	+ 1.2758	− 7.93	− 0.8992
	8	0.1832	1.250	+ 0.004	39 58	2 39.8	283 21	18 53.4	1.0274	1.2755	7.96	0.9009
	9	0.1859	·1.255	0.000	39 51	2 39.4	282 17	18 49.1	1.0271	1.2752	7.99	0.9025
	10	0.1887	1.261	− 0.005	39 51	2 39.4	281 12	18 44.8	1.0273	1.2750	8.02	0.9039
	11	0.1914	1.266	0.009	39 54	2 39.6	280 07	18 40.5	1.0280	1.2747	8.04	0.9052
	12	0.1942	+ 1.271	− 0.012	39 57	2 39.8	279 02	18 36.1	+ 1.0291	+ 1.2745	− 8.06	− 0.9064
	13	0.1969	1.276	0.013	39 57	2 39.8	277 57	18 31.8	1.0309	1.2743	8.08	0.9074
	14	0.1996	1.281	0.010	39 53	2 39.5	276 52	18 27.5	1.0332	1.2741	8.10	0.9083
	15	0.2024	1.286	− 0.004	39 47	2 39.1	275 47	18 23.1	1.0359	1.2740	8.11	0.9091
	16	0.2051	1.291	+ 0.003	39 35	2 38.3	274 42	18 18.8	1.0385	1.2739	8.12	0.9097
	17	0.2078	+ 1.296	+ 0.009	39 18	2 37.2	273 37	18 14.5	+ 1.0406	+ 1.2738	− 8.13	− 0.9102
	18	0.2106	1.301	0.013	39 00	2 36.0	272 32	18 10.1	1.0419	1.2737	8.14	0.9106
	19	0.2133	1.306	0.014	38 45	2 35.0	271 27	18 05.8	1.0424	1.2737	8.14	0.9108
	20	0.2161	1.311	0.013	38 33	2 34.2	270 22	18 01.5	1.0425	1.2737	8.14	0.9109
	21	0.2188	1.316	0.010	38 25	2 33.6	269 17	17 57.1	1.0423	1.2737	8.14	0.9109
h												
(12.0)	22	0.2215	+ 1.321	+ 0.005	38 22	2 33.5	268 12	17 52.8	+ 1.0422	+ 1.2737	− 8.14	− 0.9108
	23	0.2243	1.326	0.000	38 25	2 33.7	267 07	17 48.5	1.0424	1.2738	8.14	0.9105
	24	0.2270	1.331	− 0.004	38 29	2 33.9	266 03	17 44.2	1.0430	1.2738	8.13	0.9101
	25	0.2297	1.336	0.008	38 35	2 34.3	264 58	17 39.8	1.0441	1.2739	8.12	0.9095
	26	0.2325	1.341	0.010	38 40	2 34.7	263 53	17 35.5	1.0456	1.2740	8.11	0.9089
	27	0.2352	+ 1.346	− 0.009	38 43	2 34.9	262 49	17 31.2	+ 1.0476	+ 1.2742	− 8.09	− 0.9081
	28	0.2380	1.351	0.007	38 41	2 34.7	261 44	17 26.9	1.0498	1.2744	8.07	0.9071
	29	0.2407	1.356	0.004	38 37	2 34.5	260 40	17 22.7	1.0518	1.2746	8.05	0.9061
	30	0.2434	1.361	− 0.001	38 30	2 34.0	259 36	17 18.4	1.0538	1.2748	8.03	0.9049
	31	0.2462	1.366	+ 0.002	38 22	2 33.5	258 32	17 14.1	1.0556	1.2750	8.01	0.9035
Apr.	1	0.2489	+ 1.371	+ 0.004	38 12	2 32.8	257 27	17 09.8	+ 1.0570	+ 1.2753	− 7.98	− 0.9021
	2	0.2517	+ 1.376	+ 0.006	38 01	2 32.1	256 23	17 05.6	+ 1.0582	+ 1.2756	− 7.95	− 0.9005

(CONSTANTS OF PARIS CONFERENCE.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f In Time.	f' In Time.	G In Arc.	G In Time.	H In Arc.	H In Time.	Log g.	Log h.	i	Log i.
	y	s	s	° '	h m	° '	h m			"	
Apr. 1	0.2489	+ 1.371	+ 0.004	38 12	2 32.8	257 27	17 09.8	+ 1.0570	+ 1.2753	− 7.98	− 0.9021
2	0.2517	1.376	0.006	38 01	2 32.1	256 23	17 05.6	1.0582	1.2756	7.95	0.9005
3	0.2544	1.381	0.007	37 49	2 31.3	255 20	17 01.3	1.0587	1.2759	7.92	0.8988
4	0.2571	1.387	0.005	37 40	2 30.7	254 16	16 57.0	1.0589	1.2762	7.89	0.8969
5	0.2599	1.392	+ 0.001	37 36	2 30.4	253 12	16 52.8	1.0590	1.2765	7.85	0.8949
h (13.0) 6	0.2626	+ 1.397	− 0.004	37 38	2 30.5	252 09	16 48.6	+ 1.0596	+ 1.2769	− 7.81	− 0.8928
7	0.2653	1.403	0.008	37 43	2 30.8	251 06	16 44.4	1.0606	1.2773	7.77	0.8905
8	0.2681	1.408	0.011	37 49	2 31.2	250 03	16 40.2	1.0619	1.2777	7.73	0.8881
9	0.2708	1.414	0.012	37 56	2 31.8	249 00	16 36.0	1.0637	1.2781	7.68	0.8856
10	0.2736	1.419	0.010	38 01	2 32.1	247 57	16 31.8	1.0665	1.2786	7.64	0.8829
11	0.2763	+ 1.425	− 0.005	38 01	2 32.1	246 54	16 27.6	+ 1.0696	+ 1.2790	− 7.59	− 0.8800
12	0.2790	1.431	+ 0.001	37 53	2 31.5	245 52	16 23.4	1.0725	1.2795	7.53	0.8770
13	0.2818	1.436	0.007	37 41	2 30.7	244 49	16 19.3	1.0749	1.2800	7.48	0.8739
14	0.2845	1.442	0.012	37 26	2 29.7	243 47	16 15.1	1.0769	1.2805	7.42	0.8706
15	0.2872	1.448	0.015	37 12	2 28.8	242 45	16 11.0	1.0783	1.2810	7.36	0.8672
16	0.2900	+ 1.454	+ 0.015	37 01	2 28.1	241 44	16 06.9	+ 1.0790	+ 1.2815	− 7.30	− 0.8636
17	0.2927	1.460	0.011	36 55	2 27.7	240 42	16 02.8	1.0793	1.2820	7.24	0.8599
18	0.2955	1.466	0.007	36 55	2 27.7	239 41	15 58.7	1.0798	1.2826	7.18	0.8560
19	0.2982	1.473	+ 0.003	36 59	2 27.9	238 40	15 54.6	1.0805	1.2832	7.11	0.8520
20	0.3009	1.479	− 0.002	37 06	2 28.4	237 38	15 50.6	1.0814	1.2838	7.04	0.8477
h (14.0) 21	0.3037	+ 1.485	− 0.006	37 13	2 28.9	236 38	15 46.5	+ 1.0828	+ 1.2843	− 6.97	− 0.8434
22	0.3064	1.492	0.009	37 20	2 29.3	235 37	15 42.5	1.0849	1.2849	6.90	0.8388
23	0.3091	1.498	0.010	37 26	2 29.7	234 37	15 38.4	1.0872	1.2855	6.83	0.8341
24	0.3119	1.505	0.008	37 27	2 29.8	233 36	15 34.4	1.0894	1.2861	6.75	0.8292
25	0.3146	1.512	0.006	37 24	2 29.6	232 36	15 30.4	1.0917	1.2867	6.67	0.8241
26	0.3174	+ 1.518	− 0.003	37 19	2 29.3	231 37	15 26.4	+ 1.0941	+ 1.2874	− 6.59	− 0.8188
27	0.3201	1.525	0.000	37 13	2 28.9	230 37	15 22.5	1.0963	1.2880	6.51	0.8134
28	0.3228	1.532	+ 0.003	37 04	2 28.2	229 38	15 18.5	1.0983	1.2886	6.42	0.8078
29	0.3256	1.539	0.006	36 54	2 27.6	228 38	15 14.6	1.1000	1.2892	6.34	0.8019
30	0.3283	1.546	0.007	36 44	2 26.9	227 39	15 10.6	1.1011	1.2898	6.25	0.7959
May 1	0.3311	+ 1.553	+ 0.006	36 37	2 26.5	226 41	15 06.7	+ 1.1019	+ 1.2905	− 6.16	− 0.7896
2	0.3338	1.560	+ 0.002	36 35	2 26.3	225 42	15 02.8	1.1027	1.2911	6.07	0.7831
3	0.3365	1.568	− 0.003	36 36	2 26.4	224 44	14 58.9	1.1038	1.2917	5.98	0.7764
4	0.3393	1.575	0.007	36 39	2 26.6	223 45	14 55.0	1.1046	1.2924	5.88	0.7695
5	0.3420	1.582	0.011	36 42	2 26.8	222 47	14 51.2	1.1061	1.2930	5.79	0.7624
h (15.0) 6	0.3447	+ 1.590	− 0.013	36 47	2 27.1	221 50	14 47.3	+ 1.1083	+ 1.2937	− 5.69	− 0.7550
7	0.3475	1.597	0.012	36 51	2 27.4	220 52	14 43.5	1.1111	1.2943	5.59	0.7473
8	0.3502	1.605	0.008	36 51	2 27.4	219 55	14 39.6	1.1142	1.2949	5.49	0.7394
9	0.3530	1.613	− 0.002	36 45	2 27.0	218 57	14 35.8	1.1173	1.2955	5.39	0.7313
10	0.3557	1.620	+ 0.004	36 34	2 26.3	218 00	14 32.0	1.1202	1.2961	5.28	0.7228
11	0.3584	+ 1.628	+ 0.010	36 20	2 25.3	217 03	14 28.2	+ 1.1227	+ 1.2968	− 5.18	− 0.7141
12	0.3612	1.636	0.014	36 08	2 24.5	216 07	14 24.4	1.1248	1.2974	5.07	0.7050
13	0.3639	1.644	0.015	35 58	2 23.9	215 10	14 20.7	1.1261	1.2980	4.96	0.6957
14	0.3666	· 1.652	0.014	35 49	2 23.3	214 14	14 16.9	1.1270	1.2986	4.85	0.6860
15	0.3694	1.660	0.010	35 44	2 23.0	213 18	14 13.2	1.1278	1.2991	4.74	0.6760
16	0.3721	+ 1.669	+ 0.005	35 46	2 23.1	212 22	14 09.5	+ 1.1287	+ 1.2997	− 4.63	− 0.6656
17	0.3749	+ 1.677	0.000	35 50	2 23.3	211 26	14 05.7	+ 1.1299	+ 1.3003	− 4.52	− 0.6548

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f In Time.	f' In Time.	G In Arc	G In Time.	H In Arc	H In Time.	Log g.	Log h.	i	Log i.
	y	s	s	° '	h m	° '	h m			''	
May 17	0.3749	+ 1.677	0.000	35 50	2 23.3	211 26	14 05.7	+ 1.1299	+ 1.3003	− 4.52	− 0.6548
18	0.3776	1.686	− 0.004	35 52	2 23.5	210 30	14 02.0	1.1314	1.3008	4.40	0.6437
19	0.3803	1.695	0.006	35 54	2 23.6	209 35	13 58.3	1.1332	1.3014	4.29	0.6321
20	0.3831	1.703	0.007	35 55	2 23.7	208 40	13 54.6	1.1354	1.3019	4.17	0.6201
21	0.3858	1.712	0.007	35 55	2 23.7	207 45	13 51.0	1.1377	1.3024	4.05	0.6076
h (16.0) 22	0.3885	+ 1.721	− 0.006	35 54	2 23.6	206 49	13 47.3	+ 1.1402	+ 1.3029	− 3.93	·· 0.5947
23	0.3913	1.730	− 0.003	35 50	2 23.3	205 55	13 43.6	1.1426	1.3034	3.81	0.5812
24	0.3940	1.739	0.000	35 44	2 22.9	205 00	13 40.0	1.1449	1.3039	3.69	0.5672
25	0.3968	1.748	+ 0.003	35 35	2 22.3	204 05	13 36.4	1.1469	1.3044	3.57	0.5525
26	0.3995	1.757	0.005	35 24	2 21.6	203 11	13 32.7	1.1488	1.3049	3.45	0.5373
27	0.4022	⊦ 1.766	+ 0.006	35 14	2 20.9	202 17	13 29.1	⊹ 1.1506	+ 1.3053	− 3.32	− 0.5214
28	0.4050	1.776	0.005	35 05	2 20.3	201 23	13 25.5	1.1517	1.3058	3.20	0.5047
29	0.4077	1.785	+ 0.003	34 57	2 19.8	200 28	13 21.9	1.1525	1.3062	3.07	0.4872
30	0.4105	1.794	− 0.002	34 52	2 19.5	199 35	13 18.3	1.1535	1.3066	2.94	0.4690
31	0.4132	1.803	0.007	34 51	2 19.4	198 41	13 14.7	1.1547	1.3070	2.82	0.4498
June 1	0.4159	+ 1.813	− 0.011	34 52	2 19.5	197 47	13 11.1	+ 1.1561	+ 1.3073	− 2.69	− 0.4295
2	0.4187	1.822	0.014	34 54	2 19.6	196 54	13 07.6	1.1579	1.3077	2.56	0.4082
3	0.4214	1.832	0.014	34 55	2 19.7	196 00	13 04.0	1.1603	1.3080	2.43	0.3857
4	0.4241	1.841	0.011	34 54	2 19.6	195 07	13 00.4	1.1631	1.3084	2.30	0.3617
5	0.4269	1.851	− 0.005	34 47	2 19.1	194 13	12 56.9	1.1660	1.3087	2.17	0.3363
h (17.0) 6	0.4296	+ 1.861	+ 0.001	34 36	2 18.4	193 20	12 53.3	+ 1.1688	+ 1.3090	− 2.04	− 0.3092
7	0.4324	1.871	0.007	34 22	2 17.5	192 27	12 49.8	1.1714	1.3092	1.91	0.2801
8	0.4351	1.880	0.013	34 07	2 16.4	191 34	12 46.3	1.1735	1.3095	1.77	0.2488
9	0.4378	1.890	0.015	33 53	2 15.4	190 41	12 42.7	1.1750	1.3097	1.64	0.2150
10	0.4406	1.900	0.015	33 41	2 14.7	189 48	12 39.2	1.1760	1.3099	1.51	0.1782
11	0.4433	+ 1.910	+ 0.011	33 32	2 14.1	188 55	12 35.7	+ 1.1769	+ 1.3101	− 1.37	− 0.1378
12	0.4460	1.920	0.007	33 27	2 13.8	188 02	12 32.2	1.1777	1.3103	1.24	0.0932
13	0.4488	1.929	+ 0.002	33 26	2 13.7	187 10	12 28.6	1.1786	1.3105	1.11	0.0434
14	0.4515	1.939	− 0.002	33 27	2 13.8	186 17	12 25.1	1.1799	1.3106	0.97	9.9869
15	0.4543	1.949	0.005	33 29	2 13.9	185 24	12 21.6	1.1815	1.3108	0.84	9.9219
16	0.4570	+ 1.959	− 0.006	33 30	2 14.0	184 32	12 18.1	+ 1.1835	+ 1.3109	− 0.70	− 9.8453
17	0.4597	1.969	0.007	33 28	2 13.8	183 39	12 14.6	1.1856	1.3110	0.57	9.7520
18	0.4625	1.978	0.006	33 23	2 13.5	182 46	12 11.1	1.1878	1.3110	0.43	9.6330
19	0.4652	1.988	− 0.003	33 15	2 13.0	181 54	12 07.6	1.1899	1.3111	0.29	9.4684
20	0.4679	1.998	0.000	33 05	2 12.3	181 01	12 04.1	1.1919	1.3111	0.16	9.1999
h (18.0) 21	0.4707	+ 2.008	+ 0.003	32 55	2 11.7	180 09	12 00.6	+ 1.1937	+ 1.3111	− 0.02	− 8.3580
22	0.4734	2.018	0.005	32 44	2 10.9	179 16	11 57.1	1.1954	1.3111	+ 0.11	+ 9.0526
23	0.4762	2.028	0.006	32 31	2 10.0	178 24	11 53.6	1.1966	1.3111	0.25	9.3952
24	0.4789	2.038	0.005	32 19	2 09.3	177 31	11 50.1	1.1977	1.3110	0.38	9.5842
25	0.4816	2.047	+ 0.003	32 10	2 08.6	176 39	11 46.6	1.1987	1.3110	0.52	9.7154
26	0.4844	+ 2.057	0.000	32 02	2 08.1	175 46	11 43.1	+ 1.1993	+ 1.3109	+ 0.65	+ 9.8159
27	0.4871	2.067	− 0.005	31 57	2 07.8	174 54	11 39.6	1.2000	1.3108	0.79	9.8974
28	0.4898	2.077	0.010	31 54	2 07.6	174 01	11 36.1	1.2010	1.3107	0.92	9.9658
29	0.4926	2.087	0.013	31 53	2 07.5	173 09	11 32.6	1.2025	1.3105	1.06	0.0248
30	0.4953	2.097	0.015	31 53	2 07.5	172 16	11 29.1	1.2041	1.3104	1.19	0.0767
July 1	0.4981	+ 2.107	− 0.013	31 51	2 07.4	171 23	11 25.6	+ 1.2061	+ 1.3102	+ 1.33	+ 0.1229
2	0.5008	⊦ 2.117	− 0.007	31 44	2 07.0	170 31	11 22.0	+ 1.2083	+ 1.3100	+ 1.46	+ 0.1645

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	*f* In Time.	*f'* In Time.	*G* In Arc.	*G* In Time.	*H* In Arc.	*H* In Time.	Log *g*.	Log *h*.	*i*	Log *i*.
		y	s	s	° ′	h m	° ′	h m			″	
July	1	0.4981	+ 2.107	−0.013	31 51	2 07.4	171 23	11 25.6	+ 1.2061	+ 1.3102	+ 1.33	+ 0.1229
	2	0.5008	2.117	0.007	31 44	2 07.0	170 31	11 22.0	1.2083	1.3100	1.46	0.1645
	3	0.5035	2.126	−0.001	31 36	2 06.4	169 38	11 18.5	1.2111	1.3098	1.59	0.2024
	4	0.5063	2.136	+0.005	31 22	2 05.5	168 45	11 15.0	1.2135	1.3096	1.73	0.2371
	5	0.5090	2.146	0.011	31 07	2 04.5	167 52	11 11.5	1.2156	1.3093	1.86	0.2692
h (19.0)	6	0.5118	+ 2.156	+0.013	30 52	2 03.5	166 59	11 07.9	+ 1.2169	+ 1.3091	+ 1.99	+ 0.2989
	7	0.5145	2.166	0.014	30 39	2 02.6	166 06	11 04.4	1.2180	1.3088	2.12	0.3266
	8	0.5172	2.175	0.012	30 25	2 01.7	165 13	11 00.9	1.2187	1.3085	2.25	0.3526
	9	0.5200	2.185	0.008	30 19	2 01.3	164 20	10 57.3	1.2192	1.3082	2.38	0.3769
	10	0.5227	2.195	+0.003	30 15	2 01.0	163 27	10 53.8	1.2195	1.3078	2.51	0.3999
	11	0.5254	+ 2.204	−0.001	30 13	2 00.9	162 33	10 50.2	+ 1.2203	+ 1.3075	+ 2.64	+ 0.4216
	12	0.5282	2.214	0.005	30 12	2 00.8	161 40	10 46.7	1.2217	1.3071	2.77	0.4421
	13	0.5309	2.223	0.007	30 10	2 00.7	160 46	10 43.1	1.2231	1.3067	2.89	0.4616
	14	0.5337	2.232	0.007	30 07	2 00.5	159 53	10 39.5	1.2247	1.3063	3.02	0.4802
	15	0.5364	2.242	0.005	30 02	2 00.1	158 59	10 35.9	1.2262	1.3059	3.15	0.4979
	16	0.5391	+ 2.251	−0.002	29 55	1 59.7	158 05	10 32.3	+ 1.2280	+ 1.3055	+ 3.27	+ 0.5148
	17	0.5419	2.260	+0.001	29 47	1 59.1	157 11	10 28.7	1.2298	1.3051	3.40	0.5309
	18	0.5446	2.269	0.004	29 37	1 58.5	156 17	10 25.1	1.2315	1.3046	3.52	0.5463
	19	0.5473	2.278	0.006	29 24	1 57.6	155 23	10 21.5	1.2327	1.3041	3.64	0.5611
	20	0.5501	2.287	0.007	29 12	1 56.8	154 29	10 17.9	1.2338	1.3037	3.76	0.5753
h (20.0)	21	0.5528	+ 2.296	+0.007	29 00	1 56.0	153 34	10 14.3	+ 1.2347	+ 1.3032	+ 3.88	+ 0.5889
	22	0.5556	2.305	0.005	28 48	1 55.2	152 40	10 10.6	1.2352	1.3027	4.00	0.6020
	23	0.5583	2.313	+0.002	28 40	1 54.7	151 45	10 07.0	1.2356	1.3021	4.12	0.6146
	24	0.5610	2.322	−0.003	28 34	1 54.3	150 50	10 03.3	1.2358	1.3016	4.23	0.6267
	25	0.5638	2.330	0.008	28 32	1 54.1	149 55	9 59.7	1.2362	1.3011	4.35	0.6384
	26	0.5665	+ 2.339	−0.011	28 31	1 54.1	149 00	9 56.0	+ 1.2371	+ 1.3005	+ 4.46	+ 0.6497
	27	0.5692	2.347	0.013	28 30	1 54.0	148 05	9 52.3	1.2384	1.3000	4.58	0.6606
	28	0.5720	2.355	0.013	28 28	1 53.9	147 09	9 48.6	1.2398	1.2994	4.69	0.6710
	29	0.5747	2.364	0.010	28 23	1 53.5	146 14	9 44.9	1.2415	1.2988	4.80	0.6811
	30	0.5775	2.372	0.004	28 15	1 53.0	145 18	9 41.2	1.2434	1.2983	4.91	0.6909
	31	0.5802	+ 2.380	+0.002	28 05	1 52.3	144 22	9 37.5	+ 1.2453	+ 1.2977	+ 5.02	+ 0.7004
Aug.	1	0.5829	2.388	0.008	27 51	1 51.4	143 26	9 33.7	1.2471	1.2971	5.12	0.7095
	2	0.5857	2.396	0.012	27 37	1 50.5	142 29	9 30.0	1.2482	1.2965	5.23	0.7183
	3	0.5884	2.404	0.013	27 23	1 49.5	141 33	9 26.2	1.2490	1.2959	5.33	0.7268
	4	0.5912	2.412	0.012	27 12	1 48.8	140 36	9 22.4	1.2495	1.2952	5.43	0.7351
h (21.0)	5	0.5939	+ 2.419	+0.008	27 04	1 48.3	139 40	9 18.6	+ 1.2498	+ 1.2946	+ 5.53	+ 0.7431
	6	0.5966	2.427	+0.004	26 58	1 47.9	138 43	9 14.8	1.2498	1.2940	5.63	0.7508
	7	0.5994	2.435	−0.001	26 56	1 47.7	137 45	9 11.0	1.2502	1.2934	5.73	0.7582
	8	0.6021	2.442	0.005	26 56	1 47.7	136 48	9 07.2	1.2509	1.2928	5.83	0.7655
	9	0.6048	2.449	0.007	26 55	1 47.7	135 50	9 03.4	1.2517	1.2921	5.92	0.7725
	10	0.6076	+ 2.457	−0.008	26 52	1 47.5	134 53	8 59.5	+ 1.2528	+ 1.2915	+ 6.01	+ 0.7792
	11	0.6103	2.464	0.006	26 49	1 47.3	133 55	8 55.7	1.2541	1.2909	6.11	0.7857
	12	0.6131	2.471	−0.003	26 44	1 46.9	132 57	8 51.8	1.2555	1.2902	6.20	0.7921
	13	0.6158	2.478	0.000	26 37	1 46.5	131 58	8 47.9	1.2567	1.2896	6.28	0.7982
	14	0.6185	2.485	+0.003	26 29	1 45.9	131 00	8 44.0	1.2581	1.2890	6.37	0.8041
	15	0.6213	+ 2.491	+0.005	26 20	1 45.3	130 01	8 40.1	+ 1.2592	+ 1.2884	+ 6.45	+ 0.8098
	16	0.6240	+ 2.498	+0.007	26 09	1 44.6	129 03	8 36.2	+ 1.2599	+ 1.2877	+ 6.54	+ 0.8153

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f In Time.	f' In Time.	G In Arc.	G In Time.	H In Arc.	H In Time.	Log g.	Log h.	i	Log i.
	y	s	s	° '	h m	° '	h m			''	
Aug. 16	0.6240	+ 2.498	+ 0.007	26 09	1 44.6	129 03	8 36.2	+ 1.2599	+ 1.2877	+ 6.54	+ 0.8153
17	0.6267	2.504	0.008	25 58	1 43.9	128 04	8 32.2	1.2606	1.2871	6.62	0.8206
18	0.6295	2.511	0.007	25 49	1 43.3	127 04	8 28.3	1.2609	1.2865	6.70	0.8258
19	0.6322	2.517	+ 0.003	25 42	1 42.8	126 05	8 24.3	1.2610	1.2859	6.77	0.8307
20	0.6350	2.523	− 0.001	25 36	1 42.4	125 05	8 20.3	1.2611	1.2853	6.85	0.8355
h (22.0) 21	0.6377	+ 2.530	− 0.005	25 32	1 42.1	124 05	8 16.4	+ 1.2611	+ 1.2847	+ 6.92	+ 0.8401
22	0.6404	2.536	0.010	25 30	1 42.0	123 05	8 12.3	1.2613	1.2841	6.99	0.8446
23	0.6432	2.542	0.012	25 31	1 42.1	122 05	8 08.3	1.2618	1.2836	7.06	0.8489
24	0.6459	2.548	0.013	25 33	1 42.2	121 05	8 04.3	1.2629	1.2830	7.13	0.8530
25	0.6486	2.554	0.011	25 34	1 42.3	120 04	8 00.3	1.2643	1.2825	7.19	0.8570
26	0.6514	+ 2.560	− 0.006	25 30	1 42.0	119 04	7 56.2	+ 1.2659	+ 1.2819	+ 7.26	+ 0.8608
27	0.6541	2.566	0.000	25 22	1 41.5	118 03	7 52.2	1.2675	1.2814	7.32	0.8644
28	0.6569	2.572	+ 0.005	25 12	1 40.8	117 02	7 48.1	1.2689	1.2809	7.38	0.8679
29	0.6596	2.578	0.010	25 00	1 40.0	116 01	7 44.0	1.2700	1.2804	7.44	0.8713
30	0.6623	2.583	0.013	24 49	1 39.3	114 59	7 39.9	1.2708	1.2799	7.49	0.8745
31	0.6651	+ 2.589	+ 0.012	24 40	1 38.7	113 58	7 35.8	+ 1.2711	+ 1.2794	+ 7.54	+ 0.8776
Sept. 1	0.6678	2.595	0.010	24 32	1 38.1	112 56	7 31.7	1.2711	1.2789	7.59	0.8805
2	0.6706	2.600	+ 0.005	24 28	1 37.9	111 54	7 27.6	1.2710	1.2785	7.64	0.8833
3	0.6733	2.606	0.000	24 28	1 37.9	110 52	7 23.5	1.2710	1.2781	7.69	0.8859
4	0.6760	2.611	− 0.004	24 29	1 38.0	109 50	7 19.3	1.2712	1.2777	7.73	0.8884
h (23.0) 5	0.6788	+ 2.616	− 0.007	24 31	1 38.1	108 47	7 15.1	+ 1.2718	+ 1.2773	+ 7.78	+ 0.8908
6	0.6815	2.622	0.008	24 32	1 38.1	107 45	7 11.0	1.2726	1.2769	7.82	0.8930
7	0.6842	2.627	0.007	24 33	1 38.2	106 42	7 06.8	1.2736	1.2765	7.85	0.8951
8	0.6870	2.632	0.005	24 32	1 38.1	105 39	7 02.6	1.2749	1.2762	7.89	0.8971
9	0.6897	2.637	− 0.002	24 28	1 37.9	104 36	6 58.4	1.2761	1.2759	7.92	0.8989
10	0.6925	+ 2.643	+ 0.002	24 24	1 37.6	103 34	6 54.2	+ 1.2772	+ 1.2756	+ 7.95	+ 0.9006
11	0.6952	2.648	0.005	24 18	1 37.2	102 30	6 50.0	1.2783	1.2753	7.98	0.9021
12	0.6979	2.653	0.007	24 11	1 36.7	101 27	6 45.8	1.2790	1.2750	8.01	0.9036
13	0.7007	2.658	0.008	24 04	1 36.2	100 24	6 41.6	1.2796	1.2748	8.03	0.9049
14	0.7034	2.663	0.007	23 58	1 35.7	99 20	6 37.4	1.2800	1.2746	8.05	0.9061
15	0.7061	+ 2.668	+ 0.005	23 52	1 35.4	98 17	6 33.1	+ 1.2802	+ 1.2744	+ 8.07	+ 0.9071
16	0.7089	2.673	+ 0.001	23 47	1 35.1	97 13	6 28.9	1.2802	1.2742	8.09	0.9080
17	0.7116	2.678	− 0.003	23 46	1 35.1	96 09	6 24.6	1.2802	1.2740	8.11	0.9088
18	0.7144	2.683	0.008	23 47	1 35.1	95 06	6 20.4	1.2803	1.2739	8.12	0.9095
19	0.7171	2.688	0.012	23 50	1 35.3	94 02	6 16.1	1.2806	1.2738	8.13	0.9100
h (0.0) 20	0.7198	+ 2.693	− 0.013	23 55	1 35.7	92 58	6 11.9	+ 1.2814	+ 1.2737	+ 8.14	+ 0.9105
21	0.7226	2.698	0.011	23 59	1 35.9	91 54	6 07.6	1.2825	1.2737	8.14	0.9108
22	0.7253	2.702	0.007	24 00	1 36.0	90 50	6 03.3	1.2840	1.2737	8.15	0.9109
23	0.7280	2.707	− 0.002	23 57	1 35.8	89 46	5 59.1	1.2857	1.2737	8.15	0.9110
24	0.7308	2.712	+ 0.004	23 52	1 35.5	88 42	5 54.8	1.2872	1.2737	8.15	0.9109
25	0.7335	+ 2.717	+ 0.009	23 46	1 35.1	87 38	5 50.5	+ 1.2884	+ 1.2737	+ 8.14	+ 0.9106
26	0.7363	2.722	0.013	23 38	1 34.5	86 33	5 46.2	1.2892	1.2738	8.13	0.9103
27	0.7390	2.727	0.013	23 29	1 33.9	85 29	5 42.0	1.2896	1.2739	8.12	0.9098
28	0.7417	2.732	0.010	23 22	1 33.5	84 25	5 37.7	1.2897	1.2740	8.11	0.9092
29	0.7445	2.737	0.006	23 22	1 33.5	83 21	5 33.4	1.2897	1.2741	8.10	0.9085
30	0.7472	+ 2.742	+ 0.001	23 24	1 33.6	82 17	5 29.1	+ 1.2898	+ 1.2743	+ 8.08	+ 0.9076
Oct. 1	0.7500	+ 2.747	− 0.003	23 27	1 33.8	81 13	5 24.8	+ 1.2900	+ 1.2745	+ 8.06	+ 0.9066

FOR WASHINGTON. MEAN MIDNIGHT.

Solar Day. Sid. Hour.		τ	f In Time.	f' In Time.	G In Arc.	G In Time.	H In Arc.	H In Time.	Log g.	Log h.	i	Log i
		y	s	s	° '	h m	° '	h m			"	
Oct.	1	0.7500	+ 2.747	− 0.003	23 27	1 33.8	81 13	5 24.8	+ 1.2900	+ 1.2745	+ 8.06	+ 0.9066
	2	0.7527	2.752	0.006	23 31	1 34.1	80 09	5 20.6	1.2906	1.2747	8.04	0.9055
	3	0.7554	2.757	0.008	23 36	1 34.4	79 04	5 16.3	1.2913	1.2749	8.02	0.9042
	4	0.7581	2.762	0.008	23 40	1 34.7	78 00	5 12.0	1.2923	1.2752	7.99	0.9028
	5	0.7609	2.767	0.006	23 42	1 34.8	76 56	5 07.8	1.2935	1.2754	7.97	0.9013
h (1.0)	6	0.7636	+ 2.773	− 0.004	23 41	1 34.8	75 52	5 03.5	+ 1.2949	+ 1.2757	+ 7.94	+ 0.8997
	7	0.7664	2.778	− 0.001	23 40	1 34.7	74 48	4 59.2	1.2962	1.2760	7.91	0.8979
	8	0.7691	2.783	+ 0.003	23 38	1 34.5	73 45	4 55.0	1.2973	1.2764	7.87	0.8960
	9	0.7719	2.789	0.005	23 36	1 34.4	72 41	4 50.7	1.2984	1.2767	7.83	0.8939
	10	0.7746	2.794	0.006	23 32	1 34.1	71 37	4 46.5	1.2992	1.2771	7.79	0.8917
	11	0.7773	+ 2.800	+ 0.007	23 27	1 33.8	70 33	4 42.2	+ 1.2998	+ 1.2775	+ 7.75	+ 0.8893
	12	0.7801	2.805	0.005	23 23	1 33.5	69 30	4 38.0	1.3001	1.2779	7.71	0.8869
	13	0.7828	2.811	+ 0.002	23 20	1 33.3	68 26	4 33.8	1.3003	1.2784	7.66	0.8842
	14	0.7855	2.816	− 0.002	23 21	1 33.4	67 23	4 29.5	1.3006	1.2788	7.61	0.8814
	15	0.7883	2.822	0.007	23 24	1 33.6	66 20	4 25.3	1.3010	1.2793	7.56	0.8784
	16	0.7910	+ 2.828	− 0.011	23 29	1 33.9	65 17	4 21.1	+ 1.3016	+ 1.2798	+ 7.50	+ 0.8753
	17	0.7938	2.833	0.013	23 34	1 34.3	64 13	4 16.9	1.3024	1.2803	7.45	0.8720
	18	0.7965	2.839	0.012	23 38	1 34.5	63 11	4 12.7	1.3035	1.2808	7.39	0.8686
	19	0.7992	2.845	0.008	23 42	1 34.8	62 08	4 08.5	1.3052	1.2813	7.33	0.8650
	20	0.8020	2.851	− 0.003	23 44	1 34.9	61 05	4 04.3	1.3071	1.2819	7.27	0.8613
h (2.0)	21	0.8047	+ 2.857	+ 0.003	23 43	1 34.9	60 02	4 00.2	+ 1.3089	+ 1.2824	+ 7.20	+ 0.8574
	22	0.8074	2.863	0.009	23 38	1 34.5	59 00	3 56.0	1.3104	1.2830	7.13	0.8533
	23	0.8102	2.869	0.013	23 32	1 34.1	57 58	3 51.8	1.3115	1.2836	7.06	0.8491
	24	0.8129	2.875	0.015	23 29	1 33.9	56 55	3 47.7	1.3124	1.2842	6.99	0.8447
	25	0.8157	2.882	0.013	23 25	1 33.7	55 53	3 43.5	1.3130	1.2848	6.92	0.8401
	26	0.8184	+ 2.888	+ 0.009	23 22	1 33.5	54 51	3 39.4	+ 1.3134	+ 1.2854	+ 6.84	− 0.8353
	27	0.8211	2.894	+ 0.004	23 23	1 33.5	53 50	3 35.3	1.3135	1.2860	6.76	0.8303
	28	0.8239	2.901	− 0.001	23 27	1 33.8	52 48	3 31.2	1.3139	1.2866	6.68	0.8251
	29	0.8266	2.907	0.005	23 30	1 34.0	51 46	3 27.1	1.3146	1.2872	6.60	0.8197
	30	0.8294	2.914	0.007	23 34	1 34.3	50 45	3 23.0	1.3155	1.2879	6.52	0.8142
	31	0.8321	+ 2.921	− 0.008	23 40	1 34.7	49 44	3 18.9	+ 1.3166	+ 1.2885	+ 6.43	+ 0.8084
Nov.	1	0.8348	2.927	0.007	23 45	1 35.0	48 43	3 14.9	1.3181	1.2892	6.34	0.8024
	2	0.8376	2.934	0.004	23 47	1 35.1	47 42	3 10.8	1.3196	1.2898	6.25	0.7961
	3	0.8403	2.941	− 0.001	23 47	1 35.1	46 41	3 06.7	1.3212	1.2905	6.16	0.7897
	4	0.8430	2.948	+ 0.001	23 46	1 35.1	45 41	3 02.7	1.3226	1.2911	6.07	0.7830
h (3.0)	5	0.8458	+ 2.956	+ 0.004	23 43	1 34.9	44 40	2 58.7	+ 1.3239	+ 1.2918	+ 5.97	+ 0.7760
	6	0.8485	2.963	0.006	23 41	1 34.7	43 40	2 54.7	1.3251	1.2924	5.87	0.7689
	7	0.8513	2.970	0.007	23 38	1 34.5	42 40	2 50.6	1.3260	1.2931	5.77	0.7614
	8	0.8540	2.978	0.005	23 33	1 34.2	41 40	2 46.6	1.3267	1.2938	5.67	0.7537
	9	0.8567	2.985	+ 0.002	23 31	1 34.1	40 40	2 42.7	1.3274	1.2944	5.57	0.7457
	10	0.8595	+ 2.993	− 0.002	23 31	1 34.1	39 40	2 38.7	+ 1.3280	+ 1.2951	+ 5.46	+ 0.7374
	11	0.8622	3.001	0.006	23 32	1 34.1	38 41	2 34.7	1.3285	1.2957	5.36	0.7288
	12	0.8649	3.009	0.010	23 35	1 34.3	37 41	2 30.7	1.3293	1.2963	5.25	0.7192
	13	0.8677	3.017	0.013	23 40	1 34.7	36 42	2 26.8	1.3304	1.2970	5.14	0.7107
	14	0.8704	3.025	0.013	23 45	1 35.0	35 43	2 22.8	1.3319	1.2976	5.02	0.7011
	15	0.8732	+ 3.034	− 0.010	23 50	1 35.3	34 44	2 18.9	+ 1.3337	+ 1.2982	+ 4.91	+ 0.6912
	16	0.8759	+ 3.042	− 0.005	23 50	1 35.3	33 45	2 15.0	+ 1.3357	+ 1.2988	+ 4.80	+ 0.6809

(CONSTANTS OF PARIS CONFERENCE.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f (In Time.)	f' (In Time.)	G (In Arc.)	G (In Time.)	H (In Arc.)	H (In Time.)	Log g.	Log h.	i	Log i.
	y	s	s	° '	h m	° '	h m			"	
Nov. 16	0.8759	+ 3.042	− 0.005	23 50	1 35.3	33 45	2 15.0	+ 1.3357	+ 1.2988	+ 4.80	+ 0.6809
17	0.8786	3.051	0.000	23 47	1 35.1	32 46	2 11.1	1.3376	1.2994	4.68	0.6702
18	0.8814	3.060	+ 0.007	23 42	1 34.8	31 48	2 07.2	1.3394	1.3000	4.56	0.6591
h 19	0.8841	3.068	0.012	23 38	1 34.5	30 50	2 03.3	1.3410	1.3006	4.44	0.6476
(4.0) 20	0.8868	3.077	0.014	23 32	1 34.1	29 51	1 59.4	1.3423	1.3012	4.32	0.6356
21	0.8896	+ 3.086	+ 0.014	23 27	1 33.8	28 53	1 55.5	+ 1.3431	+ 1.3018	+ 4.20	+ 0.6231
22	0.8923	3.095	0.011	23 23	1 33.5	27 55	1 51.7	1.3438	1.3023	4.07	0.6100
23	0.8951	3.104	0.007	23 23	1 33.5	26 57	1 47.8	1.3444	1.3029	3.95	0.5965
24	0.8978	3.113	+ 0.002	23 24	1 33.6	25 59	1 44.0	1.3451	1.3034	3.82	0.5824
25	0.9005	3.123	− 0.003	23 26	1 33.7	25 02	1 40.1	1.3459	1.3039	3.69	0.5676
26	0.9033	+ 3.132	− 0.006	23 29	1 34.0	24 04	1 36.3	+ 1.3469	+ 1.3044	+ 3.57	+ 0.5522
27	0.9060	3.142	0.007	23 32	1 34.1	23 07	1 32.5	1.3481	1.3049	3.44	0.5361
28	0.9087	3.151	0.007	23 35	1 34.3	22 10	1 28.6	1.3497	1.3054	3.31	0.5192
29	0.9115	3.161	0.005	23 36	1 34.4	21 12	1 24.8	1.3513	1.3058	3.17	0.5015
30	0.9142	3.171	− 0.002	23 35	1 34.3	20 15	1 21.0	1.3530	1.3063	3.04	0.4829
Dec. 1	0.9170	+ 3.180	+ 0.001	23 33	1 34.2	19 18	1 17.2	+ 1.3547	+ 1.3067	+ 2.91	+ 0.4633
2	0.9197	3.190	0.004	23 28	1 33.9	18 21	1 13.4	1.3560	1.3071	2.77	0.4426
3	0.9224	3.200	0.006	23 24	1 33.6	17 24	1 09.6	1.3574	1.3075	2.64	0.4207
4	0.9252	3.210	0.007	23 18	1 33.2	16 28	1 05.8	1.3586	1.3079	2.50	0.3975
h (5.0) 5	0.9279	3.219	0.006	23 13	1 32.9	15 31	1 02.1	1.3596	1.3082	2.36	0.3729
6	0.9307	+ 3.229	+ 0.003	23 10	1 32.7	14 34	0 58.3	+ 1.3604	+ 1.3085	+ 2.22	+ 0.3466
7	0.9334	3.239	− 0.001	23 06	1 32.4	13 38	0 54.5	1.3611	1.3088	2.08	0.3184
8	0.9361	3.249	0.006	23 06	1 32.4	12 41	0 50.8	1.3617	1.3091	1.94	0.2882
9	0.9389	3.259	0.010	23 06	1 32.4	11 45	0 47.0	1.3624	1.3094	1.80	0.2556
10	0.9416	3.269	0.013	23 07	1 32.5	10 49	0 43.2	1.3632	1.3097	1.66	0.2201
11	0.9443	+ 3.280	− 0.015	23 09	1 32.6	9 52	0 39.5	+ 1.3645	+ 1.3099	+ 1.52	+ 0.1813
12	0.9471	3.290	0.013	23 11	1 32.7	8 56	0 35.7	1.3663	1.3101	1.38	0.1385
13	0.9498	3.300	0.008	23 10	1 32.6	8 00	0 32.0	1.3681	1.3103	1.23	0.0909
14	0.9526	3.310	− 0.002	23 06	1 32.4	7 04	0 28.2	1.3701	1.3105	1.09	0.0374
15	0.9553	3.321	+ 0.004	23 01	1 32.1	6 07	0 24.5	1.3721	1.3107	0.95	9.9760
16	0.9580	+ 3.331	+ 0.010	22 54	1 31.6	5 11	0 20.8	+ 1.3739	+ 1.3108	+ 0.80	+ 9.9044
17	0.9608	3.341	0.013	22 45	1 31.0	4 15	0 17.0	1.3753	1.3109	0.66	9.8184
18	0.9635	3.351	0.014	22 38	1 30.5	3 19	0 13.3	1.3762	1.3110	0.51	9.7110
19	0.9662	3.362	0.012	22 32	1 30.2	2 23	0 09.5	1.3769	1.3110	0.37	9.5675
h (6.0) 20	0.9690	3.372	0.008	22 27	1 29.8	1 27	0 05.8	1.3775	1.3111	0.22	9.3515
21	0.9717	+ 3.382	+ 0.003	22 26	1 29.7	0 31	0 02.1	+ 1.3780	+ 1.3111	+ 0.08	+ 8.9024
22	0.9745	3.392	− 0.001	22 26	1 29.8	359 35	23 58.3	1.3788	1.3111	− 0.06	− 8.8128
23	0.9772	3.403	0.005	22 26	1 29.8	358 39	23 54.6	1.3798	1.3111	0.21	9.3219
24	0.9799	3.413	0.006	22 27	1 29.8	357 43	23 50.8	1.3810	1.3110	0.35	9.5508
25	0.9827	3.423	0.006	22 27	1 29.8	356 47	23 47.1	1.3823	1.3110	0.50	9.6984
26	0.9854	+ 3.434	− 0.004	22 26	1 29.7	355 50	23 43.4	+ 1.3837	+ 1.3109	− 0.64	− 9.8088
27	0.9881	3.444	− 0.001	22 24	1 29.6	354 54	23 39.6	1.3851	1.3108	0.79	9.8966
28	0.9909	3.454	+ 0.001	22 19	1 29.3	353 58	23 35.9	1.3866	1.3107	0.93	9.9695
29	0.9936	3.465	0.004	22 14	1 28.9	353 02	23 32.1	1.3879	1.3105	1.08	0.0318
30	0.9964	3.475	0.006	22 07	1 28.4	352 06	23 28.4	1.3891	1.3104	1.22	0.0862
31	0.9991	+ 3.486	+ 0.007	22 01	1 28.1	351 09	23 24.6	+ 1.3902	+ 1.3102	− 1.36	− 0.1344
32	1.0018	+ 3.496	+ 0.007	21 55	1 27.7	350 13	23 20.9	+ 1.3912	+ 1.3099	− 1.51	− 0.1776

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	a Ursæ Minoris (*Polaris*). Right Ascension.	Declination *North*.	Mean Solar Date	51 Cephei (HEV.). Right Ascension.	Declination *North*.	Mean Solar Date	δ Ursæ Minoris. Right Ascension.	Declination *North*.	Mean Solar Date	λ Ursæ Minoris. Right Ascension.	Declination *North*.
Jan.	h m 1 23	° ′ +88 47	Jan.	h m 6 55	° ′ +87 12	Jan.	h m 18 03	° ′ +86 36	Jan.	h m 19 18	° ′ +88 59
	s	″		s	″		s	″		s	″
0.3	65.50	25.9	0.5	15.61	1.0	0.9	26.48	53.0	1.0	50.66	42.1
1.3	64.50	25.9	1.5	15.67	1.3	1.9	26.53	52.6	2.0	50.39	41 7
2.3	63.54	26.0	2.5	15.74	1.6	2.9	26.59	52.3	3.0	50.14	41 4
3.3	62.63	26.1	3.5	15.80	1.9	3.9	26.63	52.0	4.0	49.88	41 1
4.3	61.77	26.1	4.5	15.87	2.1	4.9	26.65	51.7	5.0	49.59	40.9
5.3	60.90	26.2	5.5	15.94	2.4	5.9	26.68	51.4	6.0	49.26	40.6
6.3	60.04	26.3	6.5	16.03	2.7	6.9	26.68	51.1	7.0	48.89	40 3
7.3	59.12	26.4	7.5	16.13	3.0	7.9	26.69	50.8	8.0	48.51	40.0
8.3	58.15	26.5	8.5	16.24	3.3	8.9	26.72	50.4	9.0	48.15	39 7
9.3	57.11	26.6	9.5	16.33	3.6	9.9	26.77	50.1	10.0	47.84	39 3
10.2	56.03	26.7	10.5	16.39	4.0	10.9	26.83	49.7	11.0	47.59	39 0
11.2	54.92	26.8	11.5	16.41	4.4	11.9	26.92	49.3	12.0	47.41	38.6
12.2	53.79	26.8	12.5	16.43	4.7	12.9	27.04	49.0	13.0	47.33	38 3
13.2	52.67	26.8	13.5	16.40	5.1	13.9	27.17	48.7	13.9	47.33	37 9
14.2	51.60	26.8	14.5	16.36	5.4	14.9	27.30	48.3	14.9	47.36	37 6
15.2	50.57	26.8	15.5	16.33	5.7	15.9	27.44	48.0	15.9	47.42	37 3
16.2	49.61	26.8	16.5	16.27	6.0	16.9	27.56	47.8	16.9	47.47	36 9
17.2	48.69	26.8	17.5	16.22	6.3	17.9	27.68	47.5	17.9	47.50	36 6
18.2	47.81	26.8	18.5	16.19	6.6	18.9	27.80	47.2	18.9	47.50	36 3
19.2	46.93	26.8	19.5	16.18	6.9	19.9	27.90	46.9	19.9	47.46	36 1
20.2	46.02	26.9	20.4	16.18	7.1	20.9	27.99	46.6	20.9	47.39	35 8
21.2	45.09	26.9	21.4	16.17	7.4	21.9	28.10	46.3	21.9	47.31	35 5
22.2	44.09	26.9	22.4	16.16	7.8	22.9	28.21	46.0	22.9	47.28	35 1
23.2	43.02	26.9	23.4	16.12	8.1	23.9	28.34	45.7	23.9	47.31	34 8
24.2	41.93	26.9	24.4	16.06	8.4	24.9	28.51	45.3	24.9	47.41	34 4
25.2	40.80	26.9	25.4	15.98	8.8	25.9	28.71	45.0	25.9	47.60	34 1
26.2	39.68	26.8	26.4	15.85	9.1	26.9	28.92	44.7	26.9	47.90	33 7
27.2	38.58	26.7	27.4	15.69	9.4	27.9	29.16	44 4	27.9	48.26	33 4
28.2	37.52	26.6	28.4	15.52	9.7	28.9	29.38	44.1	28.9	48.67	33 0
29.2	36.53	26.5	29.4	15.33	10.0	29.9	29.62	43.9	29.9	49.10	32 7
30.2	35.60	26.4	30.4	15.14	10.3	30.9	29.85	43.6	30.9	49.53	32 4
31.2	34.70	26.3	31.4	14.96	10.6	31.9	30.07	43.4	31.9	49.94	32 2
32.2	33.84	26.2	32.4	14.80	10.8	32.9	30.27	43.2	32.9	50.30	31 9

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (HEV.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	1 23	+88 47	Feb.	6 55	+87 12	Feb.	18 03	+86 36	Feb.	19, 18	+88 59
	s	″		s	″		s	″		s	″
1.2	33.84	26.2	1.4	14.80	10.8	1.9	30.27	43.2	1.9	50.30	31.9
2.2	32.99	26.1	2.4	14.65	11.1	2.9	30.47	42.9	2.9	50.62	31.6
3.2	32.11	26.1	3.4	14.50	11.3	3.9	30.67	42.7	3.9	50.93	31.3
4.2	31.21	26.0	4.4	14.36	11.6	4.9	30.87	42.4	4.9	51.23	31.0
5.2	30.26	25.9	5.4	14.22	11.9	5.9	31.10	42.1	5.9	51.58	30.7
6.2	29.23	25.8	6.4	14.06	12.2	6.9	31.33	41.8	6.9	51.97	30.4
7.2	28.19	25.7	7.4	13.86	12.5	7.9	31.58	41.5	7.9	52.44	30.1
8.2	27.12	25.6	8.4	13.65	12.9	8.9	31.87	41.3·	8.9	52.98	29.7
9.2	26.08	25.5	9.4	13.41	13.2	9.9	32.17	41.0	9.9	53.61	29.4
10.2	25.09	25.3	10.4	13.14	13.4	10.9	32.47	40.8	10.9	54.29	29.1
11.2	24.16	25.1	11.4	12.85	13.7	11.9	32.78	40.6	11.9	55.00	28.8
12.2	23.29	25.0	12.4	12.56	14.0	12.9	33.07	40.4	12.9	55.71	28.6
13.2	22.50	24.8	13.4	12.29	14.2	13.9	33.36	40.2	13.9	56.40	28.3
14.2	21.75	24.6	14.4	12.02	14.4	14.9	33.63	40.0	14.9	57.06	28.1
15.1	21.01	24.4	15.4	11.75	14.6	15.9	33.89	39.9	15.9	57.68	27.8
16.1	20.29	24.3	16.4	11.52	14.8	16.8	34.15	39.7	16.9	58.26	27.6
17.1	19.53	24.1	17.4	11.29	15.0	17.8	34.39	39.5	17.9	58.81	27.3
18.1	18.73	24.0	18.4	11.06	15.3	18.8	34.67	39.3	18.9	59.38	27.1
19.1	17.88	23.8	19.4	10.82	15.5	19.8	34.94	39.1	19.9	60.01	26.8
20.1	17.00	23.7	20.4	10.55	15.8	20.8	35.24	38.9	20.9	60.70	26.5
21.1	16.09	23.5	21.4	10.26	16.0	21.8	35.57	38.7	21.9	61.46	26.2
22.1	15.17	23.3	22.4	9.94	16.3	22.8	35.92	38.5	22.9	62.32	25.9
23.1	14.29	23.0	23.4	9.58	16.6	23.8	36.28	38.3	23.9	63.24	25.7
24.1	13.47	22.8	24.3	9.21	16.8	24.8	36.66	38.1	24.9	64.22	25.4
25.1	12.70	22.6	25.3	8.82	17.0	25.8	37.02	38.0	25.9	65.26	25.2
26.1	12.01	22.3	26.3	8.44	17.2	26.8	37.39	37.9	26.9	66.26	25.0
27.1	11.35	22.0	27.3	8.06	17.3	27.8	37.74	37.8	27.9	67.24	24.8
28.1	10.78	21.8	28.3	7.69	17.5	28.8	38.08	37.7	28.9	68.18	24.6
29.1	10.22	21.5	29.3	7.34	17.6	29.8	38.41	37.6	29.9	69.08	24.5

(CONSTANTS OF PARIS CONFERENCE.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	1 22	+88 47	Mar.	6 54	+87 12	Mar.	18 03	+86 36	Mar.	19 19	+88 59
	s	″		s	″		s	″		s	′
1.1	70.22	21.5	1.3	67.34	17.6	1.8	38.41	37.6	1.9	9.08	24 5
2.1	69.64	21.3	2.3	67.02	17.8	2.8	38.72	37.5	2.9	9.93	24 3
3.1	69.05	21.1	3.3	66.69	17.9	3.8	39.04	37.4	3.9	10.76	24 1
4.1	68.42	20.9	4.3	66.36	18.1	4.8	39.37	37.3	4.9	11.60	23.9
5.1	67.75	20.6	5.3	66.04	18.3	5.8	39.69	37.1	5.9	12.49	23 7
6.1	67.05	20.4	6.3	65.68	18.5	6.8	40.04	37.0	6.9	13.45	23 4
7.1	66.34	20.2	7.3	65.30	18.7	7.8	40.40	36.9	7.9	14.48	23 2
8.1	65.64	19.9	8.3	64.89	18.9	8.8	40.79	36.8	8.9	15.57	23 0
9.1	64.98	19.6	9.3	64.48	19.0	9.8	41.19	36.7	9.8	16.71	22 ·
10.1	64.39	19.3	10.3	64.04	19.2	10.8	41.58	36.6	10.8	17.89	22 6
11.1	63.86	19.0	11.3	63.60	19.3	11.8	41.97	36.6	11.8	19 06	22 5
12.1	63.40	18.7	12.3	63.16	19.4	12.8	42.34	36.6	12.8	20 23	22 4
13.1	63.01	18.4	13.3	62.75	19.5	13.8	42.69	36.6	13.8	21.35	22 3
14.1	62.68	18.1	14.3	62.34	19.5	14.8	43.03	36.5	14.8	22.42	22 2
15.1	62.36	17.8	15.3	61.96	19.6	15.8	43.36	36.5	15.8	23.42	22 1
16.1	62.03	17.5	16.3	61.58	19.7	16.8	43.68	36.5	16.8	24.39	22 0
17.1	61.68	17.3	17.3	61.22	19.8	17.8	44.01	36.5	17.8	25.35	21 ·
18.1	61.28	17.0	18.3	60.86	19.9	18.8	44.34	36.5	18.8	26.35	21 -
19.1	60.85	16.8	19.3	60.48	20.0	19.8	44.69	36.4	19.8	27.39	21 c
20.1	60.39	16.5	20.3	60.08	20.1	20.8	45.06	36.4	20.8	28.49	21 4
21.1	59.90	16.2	21.3	59.67	20.2	21.8	45.44	36.3	21.8	29.67	21 5
22.0	59.46	15.9	22.3	59.22	20.3	22.7	45.85	36.3	22.8	30.93	21 1
23.0	59.06	15.6	23.3	58.75	20.4	23.7	46.25	36.3	23.8	32 23	21 0
24.0	58.71	15.2	24.3	58.27	20.5	24.7	46.67	36.3	24.8	33 57	20 9
25.0	58.46	14.9	25.3	57.79	20.5	25.7	47.06		25.8	34 89	20 9
26.0	58.28	14.5	26.3	57.32	20.5	26.7	47.4			36 10	20 7
27.0	58.16	14.2	27.3	56.87	20.5	27.7				37 43	20 8
28.0	58.06	13.9	28.3	56.44	20.5	28.7				38 01	20 5
29.0	57.98	13.6	29.3	56.02	20.5	29.7				39 75	20 5
30.0	57.89	13.3	30.3	55 62	20.5	30.7				40 84	20 7
31.0	57.76	13.0	31.3	55.24	20.5	31.7				41 93	20 5
32.0	57 60	12.7	32.2	54.84	20.5	32.7					

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° '		h m	° '		h m	° '		h m	° '
Apr.	1 22	+88 47	Apr.	6 54	+87 12	Apr.	18 03	+86 36	Apr.	19 19	+88 59
	s	"		s	"		s	"		s	"
1.0	57.60	12.7	1.2	54.84	20.5	1.7	49.48	36.9	1.8	43.01	20.6
2.0	57.39	12.4	2.2	54.43	20.5	2.7	49.83	36.9	2.8	44.15	20.6
3.0	57.19	12.1	3.2	54.01	20.6	3.7	50.19	36.9	3.8	45.34	20.5
4.0	56.99	11.8	4.2	53.56	20.6	4.7	50.56	37.0	4.8	46.59	20.5
5.0	56.82	11.5	5.2	53.11	20.6	5.7	50.95	37.1	5.8	47.89	20.4
6.0	56.72	11.1	6.2	52.64	20.6	6.7	51.35	37.2	6.8	49.23	20.4
7.0	56.69	10.8	7.2	52.16	20.6	7.7	51.72	37.3	7.8	50.57	20.4
8.0	56.73	10.4	8.2	51.69	20.5	8.7	52.08	37.4	8.8	51.88	20.4
9.0	56.84	10.1	9.2	51.24	20.4	9.7	52.42	37.6	9.8	53.14	20.5
10.0	56.99	9.7	10.2	50.80	20.3	10.7	52.74	37.8	10.8	54.35	20.6
10.9	57.19	9.4	11.2	50.40	20.3	11.7	53.04	37.9	11.8	55.48	20.6
11.9	57.39	9.1	12.2	50.03	20.2	12.7	53.33	38.1	12.8	56.55	20.7
12.9	57.56	8.9	13.2	49.66	20.1	13.7	53.61	38.2	13.8	57.60	20.7
13.9	57.71	8.6	14.2	49.29	20.0	14.7	53.90	38.4	14.8	58.64	20.8
14.9	57.80	8.3	15.2	48.93	19.9	15.7	54.19	38.5	15.8	59.71	20.8
15.9	57.88	8.0	16.2	48.54	19.9	16.7	54.50	38.6	16.8	60.83	20.8
16.9	57.93	7.7	17.2	48.15	19.8	17.7	54.82	38.7	17.7	62.00	20.9
17.9	57.99	7.4	18.2	47.73	19.8	18.7	55.16	38.8	18.7	63.24	20.9
18.9	58.10	7.1	19.2	47.29	19.7	19.7	55.51	39.0	19.7	64.53	20.9
19.9	58.27	6.7	20.2	46.84	19.6	20.7	55.86	39.2	20.7	65.83	21.0
20.9	58.47	6.4	21.2	46.39	19.5	21.7	56.20	39.4	21.7	67.14	21.1
21.9	58.81	6.0	22.2	45.95	19.4	22.7	56.53	39.6	22.7	68.42	21.2
22.9	59.18	5.7	23.2	45.53	19.2	23.7	56.82	39.9	23.7	69.63	21.3
23.9	59.60	5.4	24.2	45.12	19.0	24.7	57.10	40.1	24.7	70.79	21.5
24.9	60.04		25.2	44.76	18.9	25.7	57.36	40.3	25.7	71.87	21.6
25.9	60.47		26.2	44.42	18.7	26.7	57.61	40.6	26.7	72.89	21.8
26.9	60.89		27.2	44.07	18.5	27.7	57.85	40.8	27.7	73.88	21.9
	61.		28.2	43.75	18.4	28.7	58.09	41.0	28.7	74.87	22.0
			29.2	43.41	18.3	29.6	58.35	41.1	29.7	75.87	22.1
			30.2	43.07	18.1	30.6	58.61	41.3	30.7	76.91	22.2
			31.2		18.0	31.6	58.89	41.5	31.7	78.00	22.4

FOR WASHINGTON. MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f In Time.	f' In Time.	G In Arc.	G In Time.	H In Arc.	H In Time.	Log g.	Log h.	i	Log i.
	y	s	s	° '	h m	° '	h m			"	
Oct. 1	0.7500	+ 2.747	− 0.003	23 27	1 33.8	81 13	5 24.8	+ 1.2900	+ 1.2745	+ 8.06	+ 0.9066
2	0.7527	2.752	0.006	23 31	1 34.1	80 09	5 20.6	1.2906	1.2747	8.04	0.9055
3	0.7554	2.757	0.008	23 36	1 34.4	79 04	5 16.3	1.2913	1.2749	8.02	0.9042
4	0.7581	2.762	0.008	23 40	1 34.7	78 00	5 12.0	1.2923	1.2752	7.99	0.9028
5	0.7609	2.767	0.006	23 42	1 34.8	76 56	5 07.8	1.2935	1.2754	7.97	0.9013
h (1.0) 6	0.7636	+ 2.773	− 0.004	23 41	1 34.8	75 52	5 03.5	+ 1.2949	+ 1.2757	+ 7.94	+ 0.8997
7	0.7664	2.778	− 0.001	23 40	1 34.7	74 48	4 59.2	1.2962	1.2760	7.91	0.8979
8	0.7691	2.783	+ 0.003	23 38	1 34.5	73 45	4 55.0	1.2973	1.2764	7.87	0.8960
9	0.7719	2.789	0.005	23 36	1 34.4	72 41	4 50.7	1.2984	1.2767	7.83	0.8939
10	0.7746	2.794	0.006	23 32	1 34.1	71 37	4 46.5	1.2992	1.2771	7.79	0.8917
11	0.7773	+ 2.800	+ 0.007	23 27	1 33.8	70 33	4 42.2	+ 1.2998	+ 1.2775	+ 7.75	+ 0.8893
12	0.7801	2.805	0.005	23 23	1 33.5	69 30	4 38.0	1.3001	1.2779	7.71	0.8868
13	0.7828	2.811	+ 0.002	23 20	1 33.3	68 26	4 33.8	1.3003	1.2784	7.66	0.8842
14	0.7855	2.816	− 0.002	23 21	1 33.4	67 23	4 29.5	1.3006	1.2788	7.61	0.8814
15	0.7883	2.822	0.007	23 24	1 33.6	66 20	4 25.3	1.3010	1.2793	7.56	0.8784
16	0.7910	+ 2.828	− 0.011	23 29	1 33.9	65 17	4 21.1	+ 1.3016	+ 1.2798	+ 7.50	+ 0.8753
17	0.7938	2.833	0.013	23 34	1 34.3	64 13	4 16.9	1.3024	1.2803	7.45	0.8720
18	0.7965	2.839	0.012	23 38	1 34.5	63 11	4 12.7	1.3035	1.2808	7.39	0.8686
19	0.7992	2.845	0.008	23 42	1 34.8	62 08	4 08.5	1.3052	1.2813	7.33	0.8650
20	0.8020	2.851	− 0.003	23 44	1 34.9	61 05	4 04.3	1.3071	1.2819	7.27	0.8613
h (2.0) 21	0.8047	+ 2.857	+ 0.003	23 43	1 34.9	60 02	4 00.2	+ 1.3089	+ 1.2824	+ 7.20	+ 0.8574
22	0.8074	2.863	0.009	23 38	1 34.5	59 00	3 56.0	1.3104	1.2830	7.13	0.8533
23	0.8102	2.869	0.013	23 32	1 34.1	57 58	3 51.8	1.3115	1.2836	7.06	0.8491
24	0.8129	2.875	0.015	23 29	1 33.9	56 55	3 47.7	1.3124	1.2842	6.99	0.8447
25	0.8157	2.882	0.013	23 25	1 33.7	55 53	3 43.5	1.3130	1.2848	6.92	0.8401
26	0.8184	+ 2.888	+ 0.009	23 22	1 33.5	54 51	3 39.4	+ 1.3134	+ 1.2854	+ 6.84	+ 0.8353
27	0.8211	2.894	+ 0.004	23 23	1 33.5	53 50	3 35.3	1.3135	1.2860	6.76	0.8303
28	0.8239	2.901	− 0.001	23 27	1 33.8	52 48	3 31.2	1.3139	1.2866	6.68	0.8251
29	0.8266	2.907	0.005	23 30	1 34.0	51 46	3 27.1	1.3146	1.2872	6.60	0.8197
30	0.8294	2.914	0.007	23 34	1 34.3	50 45	3 23.0	1.3155	1.2879	6.52	0.8142
31	0.8321	+ 2.921	− 0.008	23 40	1 34.7	49 44	3 18.9	+ 1.3166	+ 1.2885	+ 6.43	+ 0.8084
Nov. 1	0.8348	2.927	0.007	23 45	1 35.0	48 43	3 14.9	1.3181	1.2892	6.34	0.8024
2	0.8376	2.934	0.004	23 47	1 35.1	47 42	3 10.8	1.3196	1.2898	6.25	0.7961
3	0.8403	2.941	− 0.001	23 47	1 35.1	46 41	3 06.7	1.3212	1.2905	6.16	0.7897
4	0.8430	2.948	+ 0.001	23 46	1 35.1	45 41	3 02.7	1.3226	1.2911	6.07	0.7830
h (3.0) 5	0.8458	+ 2.956	+ 0.004	23 43	1 34.9	44 40	2 58.7	+ 1.3239	+ 1.2918	+ 5.97	+ 0.7760
6	0.8485	2.963	0.006	23 41	1 34.7	43 40	2 54.7	1.3251	1.2924	5.87	0.7689
7	0.8513	2.970	0.007	23 38	1 34.5	42 40	2 50.6	1.3260	1.2931	5.77	0.7614
8	0.8540	2.978	0.005	23 33	1 34.2	41 40	2 46.6	1.3267	1.2938	5.67	0.7537
9	0.8567	2.985	+ 0.002	23 31	1 34.1	40 40	2 42.7	1.3274	1.2944	5.57	0.7457
10	0.8595	+ 2.993	− 0.002	23 31	1 34.1	39 40	2 38.7	+ 1.3280	+ 1.2951	+ 5.46	+ 0.7374
11	0.8622	3.001	0.006	23 32	1 34.1	38 41	2 34.7	1.3285	1.2957	5.36	0.7288
12	0.8649	3.009	0.010	23 35	1 34.3	37 41	2 30.7	1.3293	1.2963	5.25	0.7199
13	0.8677	3.017	0.013	23 40	1 34.7	36 42	2 26.8	1.3304	1.2970	5.14	0.7107
14	0.8704	3.025	0.013	23 45	1 35.0	35 43	2 22.8	1.3319	1.2976	5.02	0.7011
15	0.8732	+ 3.034	− 0.010	23 50	1 35.3	34 44	2 18.9	+ 1.3337	+ 1.2982	+ 4.91	+ 0.6912
16	0.8759	+ 3.042	− 0.005	23 50	1 35.3	33 45	2 15.0	+ 1.3357	+ 1.2988	+ 4.80	+ 0.6809

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f' In Time.	f'' In Time.	G In Arc.	In Time.	H In Arc.	In Time.	Log g.	Log h.	i	Log i.
		y	s	s	° ′	h m	° ′	h m			″	
Nov.	16	0.8759	+ 3.042	− 0.005	23 50	1 35.3	33 45	2 15.0	+ 1.3357	+ 1.2988	+ 4.80	+ 0.6809
	17	0.8786	3.051	0.000	23 47	1 35.1	32 46	2 11.1	1.3376	1.2994	4.68	0.6702
	18	0.8814	3.060	+ 0.007	23 42	1 34.8	31 48	2 07.2	1.3394	1.3000	4.56	0.6591
h	19	0.8841	3.068	0.012	23 38	1 34.5	30 50	2 03.3	1.3410	1.3006	4.44	0.6476
(4.0)	20	0.8868	3.077	0.014	23 32	1 34.1	29 51	1 59.4	1.3423	1.3012	4.32	0.6356
	21	0.8896	+ 3.086	+ 0.014	23 27	1 33.8	28 53	1 55.5	+ 1.3431	+ 1.3018	+ 4.20	+ 0.6231
	22	0.8923	3.095	0.011	23 23	1 33.5	27 55	1 51.7	1.3438	1.3023	4.07	0.6100
	23	0.8951	3.104	0.007	23 23	1 33.5	26 57	1 47.8	1.3444	1.3029	3.95	0.5965
	24	0.8978	3.113	+ 0.002	23 24	1 33.6	25 59	1 44.0	1.3451	1.3034	3.82	0.5824
	25	0.9005	3.123	− 0.003	23 26	1 33.7	25 02	1 40.1	1.3459	1.3039	3.69	0.5676
	26	0.9033	+ 3.132	− 0.006	23 29	1 34.0	24 04	1 36.3	+ 1.3469	+ 1.3044	+ 3.57	+ 0.5522
	27	0.9060	3.142	0.007	23 32	1 34.1	23 07	1 32.5	1.3481	1.3049	3.44	0.5361
	28	0.9087	3.151	0.007	23 35	1 34.3	22 10	1 28.6	1.3497	1.3054	3.31	0.5192
	29	0.9115	3.161	0.005	23 36	1 34.4	21 12	1 24.8	1.3513	1.3058	3.17	0.5015
	30	0.9142	3.171	− 0.002	23 35	1 34.3	20 15	1 21.0	1.3530	1.3063	3.04	0.4829
Dec.	1	0.9170	+ 3.180	+ 0.001	23 33	1 34.2	19 18	1 17.2	+ 1.3547	+ 1.3067	+ 2.91	+ 0.4633
	2	0.9197	3.190	0.004	23 28	1 33.9	18 21	1 13.4	1.3560	1.3071	2.77	0.4426
	3	0.9224	3.200	0.006	23 24	1 33.6	17 24	1 09.6	1.3574	1.3075	2.64	0.4207
	4	0.9252	3.210	0.007	23 18	1 33.2	16 28	1 05.8	1.3586	1.3079	2.50	0.3975
h	5	0.9279	3.219	0.006	23 13	1 32.9	15 31	1 02.1	1.3596	1.3082	2.36	0.3729
(5.0)	6	0.9307	+ 3.229	+ 0.003	23 10	1 32.7	14 34	0 58.3	+ 1.3604	+ 1.3085	+ 2.22	+ 0.3466
	7	0.9334	3.239	− 0.001	23 06	1 32.4	13 38	0 54.5	1.3611	1.3088	2.08	0.3184
	8	0.9361	3.249	0.006	23 06	1 32.4	12 41	0 50.8	1.3617	1.3091	1.94	0.2882
	9	0.9389	3.259	0.010	23 06	1 32.4	11 45	0 47.0	1.3624	1.3094	1.80	0.2556
	10	0.9416	3.269	0.013	23 07	1 32.5	10 49	0 43.2	1.3632	1.3097	1.66	0.2201
	11	0.9443	+ 3.280	− 0.015	23 09	1 32.6	9 52	0 39.5	+ 1.3645	+ 1.3099	+ 1.52	+ 0.1813
	12	0.9471	3.290	0.013	23 11	1 32.7	8 56	0 35.7	1.3663	1.3101	1.38	0.1385
	13	0.9498	3.300	0.008	23 10	1 32.6	8 00	0 32.0	1.3681	1.3103	1.23	0.0909
	14	0.9526	3.310	− 0.002	23 06	1 32.4	7 04	0 28.2	1.3701	1.3105	1.09	0.0374
	15	0.9553	3.321	+ 0.004	23 01	1 32.1	6 07	0 24.5	1.3721	1.3107	0.95	9.9760
	16	0.9580	+ 3.331	+ 0.010	22 54	1 31.6	5 11	0 20.8	+ 1.3739	+ 1.3108	+ 0.80	+ 9.9044
	17	0.9608	3.341	0.013	22 45	1 31.0	4 15	0 17.0	1.3753	1.3109	0.66	9.8184
	18	0.9635	3.351	0.014	22 38	1 30.5	3 19	0 13.3	1.3762	1.3110	0.51	9.7110
	19	0.9662	3.362	0.012	22 32	1 30.2	2 23	0 09.5	1.3769	1.3110	0.37	9.5675
	20	0.9690	3.372	0.008	22 27	1 29.8	1 27	0 05.8	1.3775	1.3111	0.22	9.3515
h												
(6.0)	21	0.9717	+ 3.382	+ 0.003	22 26	1 29.7	0 31	0 02.1	+ 1.3780	+ 1.3111	+ 0.08	+ 8.9024
	22	0.9745	3.392	− 0.001	22 26	1 29.8	359 35	23 58.3	1.3788	1.3111	− 0.06	− 8.8128
	23	0.9772	3.403	0.005	22 26	1 29.8	358 39	23 54.6	1.3798	1.3111	0.21	9.3219
	24	0.9799	3.413	0.006	22 27	1 29.8	357 43	23 50.8	1.3810	1.3110	0.35	9.5508
	25	0.9827	3.423	0.006	22 27	1 29.8	356 47	23 47.1	1.3823	1.3110	0.50	9.6984
	26	0.9854	+ 3.434	− 0.004	22 26	1 29.7	355 50	23 43.4	+ 1.3837	+ 1.3109	− 0.64	− 9.8088
	27	0.9881	3.444	− 0.001	22 24	1 29.6	354 54	23 39.6	1.3851	1.3108	0.79	9.8966
	28	0.9909	3.454	+ 0.001	22 19	1 29.3	353 58	23 35.9	1.3866	1.3107	0.93	9.9695
	29	0.9936	3.465	0.004	22 14	1 28.9	353 02	23 32.1	1.3879	1.3105	1.08	0.0318
	30	0.9964	3.475	0.006	22 07	1 28.4	352 06	23 28.4	1.3891	1.3104	1.22	0.0862
	31	0.9991	+ 3.486	+ 0.007	22 01	1 28.1	351 09	23 24.6	+ 1.3902	+ 1.3102	− 1.36	− 0.1344
	32	1.0018	+ 3.496	+ 0.007	21 55	1 27.7	350 13	23 20.9	+ 1.3912	+ 1.3099	− 1.51	− 0.1776

JANUARY, 1902.

(CONSTANTS OF PARIS CONFERENCE.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*). Right Ascension.	Declination *North.*	Mean Solar Date.	51 Cephei (Hev.). Right Ascension.	Declination *North.*	Mean Solar Date.	δ Ursæ Minoris. Right Ascension.	Declination *North.*	Mean Solar Date.	λ Ursæ Minoris. Right Ascension.	Declination *North.*
Jan.	h m 1 23	+88 47	Jan.	h m 6 55	+87 12	Jan.	h m 18 03	+86 36	Jan.	h m 19 18	+88 59
	s	"		s	"		s	"		s	"
0.3	65.50	25.9	0.5	15.61	1.0	0.9	26.48	53.0	1.0	50.66	42.1
1.3	64.50	25.9	1.5	15.67	1.3	1.9	26.53	52.6	2.0	50.39	41.7
2.3	63.54	26.0	2.5	15.74	1.6	2.9	26.59	52.3	3.0	50.14	41.4
3.3	62.63	26.1	3.5	15.80	1.9	3.9	26.63	52.0	4.0	49.88	41.1
4.3	61.77	26.1	4.5	15.87	2.1	4.9	26.65	51.7	5.0	49.59	40.9
5.3	60.90	26.2	5.5	15.94	2.4	5.9	26.68	51.4	6.0	49.26	40.6
6.3	60.04	26.3	6.5	16.03	2.7	6.9	26.68	51.1	7.0	48.89	40.3
7.3	59.12	26.4	7.5	16.13	3.0	7.9	26.69	50.8	8.0	48.51	40.0
8.3	58.15	26.5	8.5	16.24	3.3	8.9	26.72	50.4	9.0	48.15	39.7
9.3	57.11	26.6	9.5	16.33	3.6	9.9	26.77	50.1	10.0	47.84	39.3
10.2	56.03	26.7	10.5	16.39	4.0	10.9	26.83	49.7	11.0	47.59	39.0
11.2	54.92	26.8	11.5	16.41	4.4	11.9	26.92	49.3	12.0	47.41	38.6
12.2	53.79	26.8	12.5	16.43	4.7	12.9	27.04	49.0	13.0	47.33	38.3
13.2	52.67	26.8	13.5	16.40	5.1	13.9	27.17	48.7	13.9	47.33	37.9
14.2	51.60	26.8	14.5	16.36	5.4	14.9	27.30	48.3	14.9	47.36	37.6
15.2	50.57	26.8	15.5	16.33	5.7	15.9	27.44	48.0	15.9	47.42	37.3
16.2	49.61	26.8	16.5	16.27	6.0	16.9	27.56	47.8	16.9	47.47	36.9
17.2	48.69	26.8	17.5	16.22	6.3	17.9	27.68	47.5	17.9	47.50	36.6
18.2	47.81	26.8	18.5	16.19	6.6	18.9	27.80	47.2	18.9	47.50	36.3
19.2	46.93	26.8	19.5	16.18	6.9	19.9	27.90	46.9	19.9	47.46	36.1
20.2	46.02	26.9	20.4	16.18	7.1	20.9	27.99	46.6	20.9	47.39	35.8
21.2	45.09	26.9	21.4	16.17	7.4	21.9	28.10	46.3	21.9	47.31	35.5
22.2	44.09	26.9	22.4	16.16	7.8	22.9	28.21	46.0	22.9	47.28	35.1
23.2	43.02	26.9	23.4	16.12	8.1	23.9	28.34	45.7	23.9	47.31	34.8
24.2	41.93	26.9	24.4	16.06	8.4	24.9	28.51	45.3	24.9	47.41	34.4
25.2	40.80	26.9	25.4	15.98	8.8	25.9	28.71	45.0	25.9	47.60	34.1
26.2	39.68	26.8	26.4	15.85	9.1	26.9	28.92	44.7	26.9	47.90	33.7
27.2	38.58	26.7	27.4	15.69	9.4	27.9	29.16	44.4	27.9	48.26	33.4
28.2	37.52	26.6	28.4	15.52	9.7	28.9	29.38	44.1	28.9	48.67	33.0
29.2	36.53	26.5	29.4	15.33	10.0	29.9	29.62	43.9	29.9	49.10	32.7
30.2	35.60	26.4	30.4	15.14	10.3	30.9	29.85	43.6	30.9	49.53	32.4
31.2	34.70	26.3	31.4	14.96	10.6	31.9	30.07	43.4	31.9	49.94	32.2
32.2	33.84	26.2	32.4	14.80	10.8	32.9	30.27	43.2	32.9	50.30	31.9

(CONSTANTS OF PARIS CONFERENCE.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	1 23	+88 47	Feb.	6 55	+87 12	Feb.	18 03	+86 36	Feb.	19 18	+88 59
	s	″		s	″		s	″		s	″
1.2	33.84	26.2	1.4	14.80	10.8	1.9	30.27	43.2	1.9	50.30	31.9
2.2	32.99	26.1	2.4	14.65	11.1	2.9	30.47	42.9	2.9	50.62	31.6
3.2	32.11	26.1	3.4	14.50	11.3	3.9	30.67	42.7	3.9	50.93	31.3
4.2	31.21	26.0	4.4	14.36	11.6	4.9	30.87	42.4	4.9	51.23	31.0
5.2	30.26	25.9	5.4	14.22	11.9	5.9	31.10	42.1	5.9	51.58	30.7
6.2	29.23	25.8	6.4	14.06	12.2	6.9	31.33	41.8	6.9	51.97	30.4
7.2	28.19	25.7	7.4	13.86	12.5	7.9	31.58	41.5	7.9	52.44	30.1
8.2	27.12	25.6	8.4	13.65	12.9	8.9	31.87	41.3	8.9	52.98	29.7
9.2	26.08	25.5	9.4	13.41	13.2	9.9	32.17	41.0	9.9	53.61	29.4
10.2	25.09	25.3	10.4	13.14	13.4	10.9	32.47	40.8	10.9	54.29	29.1
11.2	24.16	25.1	11.4	12.85	13.7	11.9	32.78	40.6	11.9	55.00	28.8
12.2	23.29	25.0	12.4	12.56	14.0	12.9	33.07	40.4	12.9	55.71	28.6
13.2	22.50	24.8	13.4	12.29	14.2	13.9	33.36	40.2	13.9	56.40	28.3
14.2	21.75	24.6	14.4	12.02	14.4	14.9	33.63	40.0	14.9	57.06	28.1
15.1	21.01	24.4	15.4	11.75	14.6	15.9	33.89	39.9	15.9	57.68	27.8
16.1	20.29	24.3	16.4	11.52	14.8	16.8	34.15	39.7	16.9	58.26	27.6
17.1	19.53	24.1	17.4	11.29	15.0	17.8	34.39	39.5	17.9	58.81	27.3
18.1	18.73	24.0	18.4	11.06	15.3	18.8	34.67	39.3	18.9	59.38	27.1
19.1	17.88	23.8	19.4	10.82	15.5	19.8	34.94	39.1	19.9	60.01	26.8
20.1	17.00	23.7	20.4	10.55	15.8	20.8	35.24	38.9	20.9	60.70	26.5
21.1	16.09	23.5	21.4	10.26	16.0	21.8	35.57	38.7	21.9	61.46	26.2
22.1	15.17	23.3	22.4	9.94	16.3	22.8	35.92	38.5	22.9	62.32	25.9
23.1	14.29	23.0	23.4	9.58	16.6	23.8	36.28	38.3	23.9	63.24	25.7
24.1	13.47	22.8	24.3	9.21	16.8	24.8	36.66	38.1	24.9	64.22	25.4
25.1	12.70	22.6	25.3	8.82	17.0	25.8	37.02	38.0	25.9	65.26	25.2
26.1	12.01	22.3	26.3	8.44	17.2	26.8	37.39	37.9	26.9	66.26	25.0
27.1	11.35	22.0	27.3	8.06	17.3	27.8	37.74	37.8	27.9	67.24	24.8
28.1	10.78	21.8	28.3	7.69	17.5	28.8	38.08	37.7	28.9	68.18	24.6
29.1	10.22	21.5	29.3	7.34	17.6	29.8	38.41	37.6	29.9	69.08	24.5

MARCH, 1902.

(CONSTANTS OF PARIS CONFERENCE.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (HEV.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Mar.	h m 1 22	° ′ +88 47	Mar.	h m 6 54	° ′ +87 12	Mar.	h m 18 03	° ′ +86 36	Mar.	h m 19 19	° ′ +88 59
	s	″		s	″		s	″		s	″
1.1	70.22	21.5	1.3	67.34	17.6	1.8	38.41	37.6	1.9	9.08	24.5
2.1	69.64	21.3	2.3	67.02	17.8	2.8	38.72	37.5	2.9	9.93	24.3
3.1	69.05	21.1	3.3	66.69	17.9	3.8	39.04	37.4	3.9	10.76	24.1
4.1	68.42	20.9	4.3	66.36	18.1	4.8	39.37	37.3	4.9	11.60	23.9
5.1	67.75	20.6	5.3	66.04	18.3	5.8	39.69	37.1	5.9	12.49	23.7
6.1	67.05	20.4	6.3	65.68	18.5	6.8	40.04	37.0	6.9	13.45	23.4
7.1	66.34	20.2	7.3	65.30	18.7	7.8	40.40	36.9	7.9	14.48	23.2
8.1	65.64	19.9	8.3	64.89	18.9	8.8	40.79	36.8	8.9	15.57	23.0
9.1	64.98	19.6	9.3	64.48	19.0	9.8	41.19	36.7	9.8	16.71	22.8
10.1	64.39	19.3	10.3	64.04	19.2	10.8	41.58	36.6	10.8	17.89	22.6
11.1	63.86	19.0	11.3	63.60	19.3	11.8	41.97	36.6	11.8	19.06	22.5
12.1	63.40	18.7	12.3	63.16	19.4	12.8	42.34	36.6	12.8	20.23	22.4
13.1	63.01	18.4	13.3	62.75	19.5	13.8	42.69	36.6	13.8	21.35	22.3
14.1	62.68	18.1	14.3	62.34	19.5	14.8	43.03	36.5	14.8	22.42	22.2
15.1	62.36	17.8	15.3	61.96	19.6	15.8	43.36	36.5	15.8	23.42	22.1
16.1	62.03	17.5	16.3	61.58	19.7	16.8	43.68	36.5	16.8	24.39	22.0
17.1	61.68	17.3	17.3	61.22	19.8	17.8	44.01	36.5	17.8	25.35	21.8
18.1	61.28	17.0	18.3	60.86	19.9	18.8	44.34	36.5	18.8	26.35	21.7
19.1	60.85	16.8	19.3	60.48	20.0	19.8	44.69	36.4	19.8	27.39	21.6
20.1	60.39	16.5	20.3	60.08	20.1	20.8	45.06	36.4	20.8	28.49	21.4
21.1	59.90	16.2	21.3	59.67	20.2	21.8	45.44	36.3	21.8	29.67	21.3
22.0	59.46	15.9	22.3	59.22	20.3	22.7	45.85	36.3	22.8	30.93	21.1
23.0	59.06	15.6	23.3	58.75	20.4	23.7	46.25	36.3	23.8	32.23	21.0
24.0	58.71	15.2	24.3	58.27	20.5	24.7	46.67	36.3	24.8	33.57	20.9
25.0	58.46	14.9	25.3	57.79	20.5	25.7	47.06	36.4	25.8	34.89	20.9
26.0	58.28	14.5	26.3	57.32	20.5	26.7	47.45	36.5	26.8	36.19	20.8
27.0	58.16	14.2	27.3	56.87	20.5	27.7	47.81	36.6	27.8	37.43	20.8
28.0	58.06	13.9	28.3	56.44	20.5	28.7	48.15	36.6	28.8	38.61	20.8
29.0	57.98	13.6	29.3	56.02	20.5	29.7	48.49	36.7	29.8	39.75	20.8
30.0	57.89	13.3	30.3	55.62	20.5	30.7	48.82	36.8	30.8	40.84	20.7
31.0	57.76	13.0	31.3	55.24	20.5	31.7	49.14	36.8	31.8	41.92	20.7
32.0	57.60	12.7	32.2	54.84	20.5	32.7	49.48	36.9	32.8	43.01	20.6

(CONSTANTS OF PARIS CONFERENCE.)

CIRCUM-POLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (Hᴇᴠ.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	1 22	+88 47	Apr.	6 54	+87 12	Apr.	18 03	+86 36	Apr.	19 19	+88 59
	s	″		s	″		s	″		s	″
1.0	57.60	12.7	1.2	54.84	20.5	1.7	49.48	36.9	1.8	43.01	20.6
2.0	57.39	12.4	2.2	54.43	20.5	2.7	49.83	36.9	2.8	44.15	20.6
3.0	57.19	12.1	3.2	54.01	20.6	3.7	50.19	36.9	3.8	45.34	20.5
4.0	56.99	11.8	4.2	53.56	20.6	4.7	50.56	37.0	4.8	46.59	20.5
5.0	56.82	11.5	5.2	53.11	20.6	5.7	50.95	37.1	5.8	47.89	20.4
6.0	56.72	11.1	6.2	52.64	20.6	6.7	51.35	37.2	6.8	49.23	20.4
7.0	56.69	10.8	7.2	52.16	20.6	7.7	51.72	37.3	7.8	50.57	20.4
8.0	56.73	10.4	8.2	51.69	20.5	8.7	52.08	37.4	8.8	51.88	20.4
9.0	56.84	10.1	9.2	51.24	20.4	9.7	52.42	37.6	9.8	53.14	20.5
10.0	56.99	9.7	10.2	50.80	20.3	10.7	52.74	37.8	10.8	54.35	20.6
10.9	57.19	9.4	11.2	50.40	20.3	11.7	53.04	37.9	11.8	55.48	20.6
11.9	57.39	9.1	12.2	50.03	20.2	12.7	53.33	38.1	12.8	56.55	20.7
12.9	57.56	8.9	13.2	49.66	20.1	13.7	53.61	38.2	13.8	57.60	20.7
13.9	57.71	8.6	14.2	49.29	20.0	14.7	53.90	38.4	14.8	58.64	20.8
14.9	57.80	8.3	15.2	48.93	19.9	15.7	54.19	38.5	15.8	59.71	20.8
15.9	57.88	8.0	16.2	48.54	19.9	16.7	54.50	38.6	16.8	60.83	20.8
16.9	57.93	7.7	17.2	48.15	19.8	17.7	54.82	38.7	17.7	62.00	20.9
17.9	57.99	7.4	18.2	47.73	19.8	18.7	55.16	38.8	18.7	63.24	20.9
18.9	58.10	7.1	19.2	47.29	19.7	19.7	55.51	39.0	19.7	64.53	20.9
19.9	58.27	6.7	20.2	46.84	19.6	20.7	55.86	39.2	20.7	65.83	21.0
20.9	58.47	6.4	21.2	46.39	19.5	21.7	56.20	39.4	21.7	67.14	21.1
21.9	58.81	6.0	22.2	45.95	19.4	22.7	56.53	39.6	22.7	68.42	21.2
22.9	59.18	5.7	23.2	45.53	19.2	23.7	56.82	39.9	23.7	69.63	21.3
23.9	59.60	5.4	24.2	45.12	19.0	24.7	57.10	40.1	24.7	70.79	21.5
24.9	60.04	5.1	25.2	44.76	18.9	25.7	57.36	40.3	25.7	71.87	21.6
25.9	60.47	4.8	26.2	44.42	18.7	26.7	57.61	40.6	26.7	72.89	21.8
26.9	60.89	4.6	27.2	44.07	18.5	27.7	57.85	40.8	27.7	73.88	21.9
27.9	61.27	4.3	28.2	43.75	18.4	28.7	58.09	41.0	28.7	74.87	22.0
28.9	61.61	4.1	29.2	43.41	18.3	29.6	58.35	41.1	29.7	75.87	22.1
29.9	61.91	3.8	30.2	43.07	18.1	30.6	58.61	41.3	30.7	76.91	22.2
30.9	62.21	3.5	31.2	42.71	18.0	31.6	58.89	41.5	31.7	78.00	22.4
31.9	62.53	3.2									

CIRCUMPOLAR· STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	1 23	+88 46	May	6 54	+87 12	May	18 03	+86 36	May	19 20	+88 59
	s	″		s	″		s	″		s	″
1.9	2.53	63.2	1.2	42.71	18.0	1.6	58.89	41 5	1.7	18.00	22.4
2.9	2.90	62.9	2.2	42 33	17.9	2.6	59.17	41.7	2.7	19.13	22.5
3.9	3.33	62.6	3.2	41.96	17.7	3.6	59.46	42.0	3.7	20.30	22.6
4.9	•3.84	62.3	4.2	41.57	17.6	4.6	59.73	42 2	4.7	21.47	22.7
5.9	4.42	62.0	5.2	41 18	17.4	5.6	59.99	42.5	5.7	22.60	22.9
6.9	5.06	61.7	6.2	40.82	17.1	6.6	60.23	42.8	6.7	23.71	23.1
7.9	5.74	61.4	7.1	40.48	16.9	7.6	60.45	43 1	7.7	24.73	23.3
8.9	6.42	61.2	8.1	40.17	16.7	8.6	60.64	43.4	8 6	25.68	23.5
9.9	7.08	61.0	9.1	39.89	16.4	9.6	60.80	43.7	9.6	26.55	23.8
10.9	7.73	60.8	10.1	39.63	16.2	10.6	60.97	43.9	10.6	27.36	24.0
11.9	8.31	60.6	11.1	39.39	16.0	11.6	61.12	44.2	11.6	28.15	24.2
12.9	8.86	60.4	12.1	39.15	15.8	12.6	61.29	44.4	12.6	28.94	24.3
13.9	9.39	60.1	13.1	38.88	15.6	13.6	61.46	44.7	13.6	29.77	24.5
14.9	9.91	59.9	14.1	38.61	15.4	14.6	61.66	44.9	14.6	30.65	24.7
15.9	10.45	59.7	15.1	38.33	15.2	15.6	61.86	45.2	15.6	31.57	24.9
16.9	11.05	59.4	16.1	38.04	15.0	16.6	62.07	45.4	16.6	32.55	25.1
17.9	11.71	59.1	17.1	37.71	14.8	17.6	62.28	45.7	17.6	33.54	25.3
18.9	12.42	58.9	18.1	37.39	14.6	18.6	62.49	46.0	18.6	34.54	25.5
19.9	13.22	58.6	19.1	37.09	14.3	19.6	62.68	46.3	19.6	35.51	25.7
20.9	14.06	58.4	20.1	36.80	14.0	20.6	62.85	46.6	20.6	36 42	26.0
21.9	14.91	58.2	21.1	36.54	13.8	21.6	62.98	47.0	21.6	37.26	26.3
22.9	15.79	58.0	22.1	36.30	13.5	22.6	63.11	47.3	22.6	38.02	26.5
23.9	16.62	57.8	23.1	36 09	13.2	23.6	63.21	47.6	23.6	38.72	26.8
24.9	17.43	57.7	24.1	35.91	12.9	24.6	63.29	47.9	24.6	39.35	27.1
25.9	18.18	57.5	25.1	35.74	12.7	25.6	63.38	48.2	25.6	39.96	27.3
26.9	18.89	57.3	26.1	35.55	12.4	26.6	63.49	48.5	26.6	40.57	27.6
27.9	19.59	57.2	27.1	35.38	12.2	27.6	63.59	48.8	27.6	41.21	27.8
28.9	20.29	57.0	28.1	35.20	11.9	28.6	63.70	49.0	28.6	41.88	28.0
29.9	21.02	56.8	29.1	34.99	11.7	29.6	63.82	49.3	29.6	42.60	28.2
30.9	21.80	56.6	30.1	34.77	11.5	30.6	63.95	49.6	30.6	43.34	28.5
31.9	22.64	56.4	31.1	34.57	11.2	31.6	64.07	49.9	31.6	44.08	28.7
32.9	23.54	56.2	32.1	34.35	10.9	32.6	64.17	50.3	32.6	44.81	29.0

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (HEV.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
June	h m 1 23	° ' +88 46	June	h m 6 54	° ' +87 12	June	h m 18 04	° ' +86 36	June	h m 19 20	° ' +88 59
	s	"		s	"		s	"		s	"
1.9	23.54	56.2	1 1	34.35	10 9	1.6	4.17	50.3	1.6	44.81	29.0
2.9	24.50	56.0	2.1	34.15	10.6	2.6	4.26	50.6	2.6	45.48	29.3
3.8	25.51	55.9	3.1	33.98	10.3	3.5	4.32	51.0	3.6	46.09	29.6
4.8	26.54	55.8	4.1	33.84	9.9	4.5	4.36	51.4	4.6	46.62	30.0
5.8	27.54	55.7	5.1	33.75	9.6	5.5	4.38	51.7	5.6	47.08	30.3
6.8	28.53	55.6	6.1	33.66	9.3	6.5	4.37	52.0	6.6	47.46	30.6
7.8	29.47	55.5	7.1	33 59	9.0	7.5	4.36	52.3	7.6	47.78	30.9
8.8	30.33	55.4	8.1	33.54	8.7	8.5	4.35	52.7	8.6	48.09	31.2
9.8	31.19	55.3	9.1	33.48	8.4	9.5	4.35	53.0	9.6	48.42	31.5
10.8	32.00	55.2	10.1	33.40	8.1	10.5	4.36	53.2	10.6	48.78	31.7
11.8	32.82	55.1	11.1	33.32	7.9	11.5	4.40	53.5	11.6	49.18	32.0
12.8	33.68	55.0	12.1	33.23	7.6	12.5	4.44	53.8	12.6	49.65	32.3
13.8	34.60	54.8	13.0	33.12	7.3	13.5	4.48	54.1	13.6	50.14	32.6
14.8	35.56	54.7	14.0	33.00	7.0	14.5	4.51	54.5	14.6	50.64	32.9
15.8	36.60	54.6	15.0	32.89	6.7	15.5	4.53	54.8	15.6	51.12	33.2
16.8	37.66	54.5	16 0	32.79	6.4	16.5	4.53	55.2	16.6	51.55	33.5
17.8	38.78	54.4	17.0	32.72	6.0	17.5	4.51	55.5	17.6	51.91	33.9
18.8	39.90	54.3	18.0	32.67	5.7	18.5	4.47	55.9	18.6	52.18	34.2
19.8	40.97	54.3	19.0	32.66	5.3	19.5	4.40	56.3	19.6	52.36	34.6
20.8	42.03	54.2	20.0	32.66	5.0	20.5	4.32	56.6	20.6	52.48	34.9
21.8	43.02	54.2	21.0	32.68	4.7	21.5	4.24	56.9	21.6	52.55	35 2
22.8	43.96	54.2	22.0	32.71	4.4	22.5	4.15	57.2	22.6	52.63	35.5
23.8	44.87	54.2	23.0	32.74	4.1	23.5	4.07	57.5	23.6	52.72	35.8
24.8	45.75	54.2	24.0	32.77	3.8	24.5	4.00	57.8	24.6	52.84	36.1
25.8	46.65	54.1	25.0	32.78	3.5	25.5	3.95	58.1	25.6	53.02	36.4
26.8	47.61	54.1	26.0	32.77	3.3	26.5	3.90	58.4	26.6	53.21	36.7
27.8	48.60	54.0	27.0	32.76	3.0	27.5	3.85	58.7	27.6	53.41	37.0
28.8	49.66	53.9	28.0	32.75	2.7	28.5	3.79	59.0	28.6	53.60	37.3
29.8	50.77	53.9	29.0	32.75	2.3	29.5	3.71	59.4	29.5	53.75	37.7
30.8	51.93	53.9	30.0	32.79	2.0	30.5	3.61	59.7	30.5	53.83	38.0
31.8	53.09	53.9	31.0	32.84	1.6	31.5	3.48	60.1	31.5	53.83	38.4

(CONSTANTS OF PARIS CONFERENCE.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (HEV.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
July	h m 1 23	° ′ +88 46	July	h m 6 54	° ′ +87 11	July	h m 18 03	° ′ +86 37	July	h m 19 20	° ′ +88 59
	s	″		s	″		s	″		s	″
1.8	53.09	53.9	1.0	32.84	61.6	1.5	63.48	0.1	1.5	53.83	38.4
2.8	54.26	53.9	2.0	32.91	61.2	2.5	63.33	0.4	2.5	53.75	38.8
3.8	55.39	54.0	3.0	33.03	60.9	3.5	63.16	0.8	3.5	53.59	39.2
4.8	56.46	54.1	3.9	33.17	60.6	4.5	62.98	1.1	4.5	53.36	39.5
5.8	57.48	54.1	4.9	33.32	60.2	5.5	62.79	1.4	5.5	53.11	39.8
6.8	58.45	54.2	5.9	33.47	59.9	6.5	62.61	1.7	6.5	52.87	40.1
7.8	59.40	54.3	6.9	33.61	59.6	7.5	62.44	1.9	7.5	52.66	40.4
8.8	60.32	54.3	7.9	33.74	59.4	8.5	62.29	2.2	8.5	52.48	40.7
9.8	61.26	54.3	8.9	33.86	59.1	9.5	62.16	2.5	9.5	52.34	41.0
10.7	62.25	54.3	9.9	33.96	58.8	10.5	62.02	2.7	10.5	52.24	41.3
11.7	63.26	54.4	10.9	34.04	58.5	11.5	61.89	3.0	11.5	52.16	41.6
12.7	64.33	54.4	11.9	34.13	58.2	12.4	61.76	3.4	12.5	52.08	42.0
13.7	65.45	54.4	12.9	34.24	57.8	13.4	61.59	3.7	13.5	51.95	42.3
14.7	66.61	54.5	13.9	34.36	57.5	14.4	61.42	4.0	14.5	51.77	42.7
15.7	67.78	54.6	14.9	34.51	57.2	15.4	61.21	4.3	15.5	51.51	43.1
16.7	68.91	54.7	15.9	34.68	56.8	16.4	60.99	4.7	16.5	51.16	43 4
17.7	70.02	54.8	16.9	34.90	56.5	17.4	60.75	5.0	17.5	50.73	43.8
18.7	71.07	54.9	17.9	35.12	56.2	18.4	60.49	5.2	18.5	50.26	44.1
19.7	72.04	55.0	18.9	35.35	55.9	19.4	60.25	5.5	19.5	49 77	44.4
20.7	72.98	55.2	19.9	35.59	55.6	20.4	59.99	5.8	20.5	49.29	44.7
21.7	73.88	55.3	20.9	35.82	55.3	21.4	59.77	6.0	21.5	48.82	45.0
22.7	74 77	55.4	21.9	36.05	55.0	22.4	59.55	6.2	22.5	48.38	45.3
23.7	75.69	55.5	22.9	36.24	54.8	23.4	59.34	6.5	23.5	48.00	45.6
24.7	76.65	55.6	23.9	36.44	54.5	24.4	59.14	6.7	24.5	47.63	45.9
25.7	77.66	55.7	24.9	36.64	54.2	25.4	58.92	7.0	25.5	47.27	46.2
26.7	78.73	55.8	25.9	36.83	53.9	26 4	58.69	7.3	26.5	46.87	46.6
27.7	79.83	55.9	26.9	37.04	53.6	27.4	58.45	7.6	27.5	46.42	46.9
28.7	80.98	56.1	27.9	37.28	53.3	28.4	58.17	7.8	28.5	45.90	47.3
29.7	82.12	56.2	28.9	37.54	52.9	29.4	57.88	8.1	29.5	45.30	47.6
30 7	83.20	56.4	29.9	37.84	52.6	30.4	57.57	8.4	30.5	44.61	48.0
31 7	84.26	56.6	30.9	38.15	52.3	31.4	57.24	8.7	31.5	43.86	48.3
32.7	85.25	56.8	31.9	38.49	52.0	32.4	56.92	8.9	32.5	43.06	48.6

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	1 24	+88 46	Aug.	6 54	+87 11	Aug.	18 03	+86 37	Aug.	19 20	+88 59
	s	″		s	″		s	″		s	″
1.7	25.25	56.8	1.9	38.84	51.7	1.4	56.92	8.9	1.5	43.06	48.6
2.7	26.16	57.0	2.9	39.18	51.5	2.4	56.59	9.1	2.4	42.27	48.9
3.7	27.03	57.3	3.9	39.49	51.3	3.4	56.27	9.3	3.4	41.48	49.2
4.7	27.87	57.4	4.9	39.79	51.0	4.4	55.97	9.5	4.4	40.75	49.4
5.7	28.73	57.6	5.9	40.08	50.8	5.4	55.69	9.7	5.4	40.07	49.7
6.7	29.59	57.8	6.9	40.36	50.5	6.4	55.42	9.9	6.4	39.43	50.0
7.7	30.49	57.9	7.9	40.62	50.3	7.4	55.15	10.1	7.4	38.81	50.3
8.7	31.45	58.1	8.9	40.90	50.0	8.4	54.87	10.3	8.4	38.18	50.6
9.7	32.44	58.3	9.9	41.19	49.7	9.4	54.59	10.6	9.4	37.53	50.9
10.7	33.49	58.4	10.9	41.52	49.4	10.4	54.27	10.8	10.4	36.85	51.2
11.7	34.52	58.6	11.9	41.86	49.1	11.4	53.94	11.1	11.4	36.09	51.5
12.7	35.54	58.9	12.9	42.22	48.8	12.4	53.59	11.3	12.4	35.25	51.8
13.7	36.52	59.1	13.9	42.60	48.6	13.4	53.23	11.5	13 4	34.34	52.1
14.7	37.45	59.4	14.9	43.02	48.3	14.4	52.86	11.7	14.4	33.37	52.4
15.6	38.32	59.6	15.9	43.43	48.1	15.4	52.48	11.9	15.4	32.37	52.7
16.6	39.12	59.9	16.9	43.82	47.9	16.3	52.11	12.1	16.4	31.38	53.0
17.6	39.87	60.1	17.9	44.22	47.7	17.3	51.76	12.2	17.4	30.40	53.2
18.6	40.60	60.4	18.9	44.59	47.5	18.3	51.41	12.4	18.4	29.45	53.5
19.6	41.33	60.6	19.9	44.94	47.3	19.3	51.07	12.5	19.4	28.56	53.7
20.6	42.11	60.8	20.9	45.29	47.1	20.3	50.75	12.6	20.4	27.70	53.9
21.6	42.92	61.1	21.9	45.65	46.8	21.3	50.43	12.8	21.4	26.84	54.2
22.6	43.79	61.3	22.9	46.00	46.6	22.3	50.10	13.0	22.4	25.98	54.4
23.6	44.68	61.5	23.9	46.39	46.3	23.3	49.74	13.2	23.4	25.08	54.7
24.6	45.61	61.8	24.8	46.79	46.1	24.3	49.39	13.4	24.4	24.11	55.0
25.6	46.56	62.1	25.8	47.22	45.8	25.3	48.99	13.6	25.4	23.07	55.3
26.6	47.47	62.4	26.8	47.69	45.6	26.3	48.57	13.7	26.4	21.94	55.6
27.6	48.32	62.7	27.8	48.16	45.4	27.3	48.16	13.9	27.4	20.75	55.8
28.6	49.12	63.0	28.8	48.64	45.2	28.3	47.72	14.0	28.4	19.53	56.1
29.6	49.85	63.3	29.8	49.12	45.0	29.3	47.28	14.1	29.4	18.28	56.3
30.6	50.52	63.6	30.8	49.60	44.8	30.3	46.87	14.2	30.4	17.05	56.5
31.6	51.15	63.9	31.8	50.05	44.7	31.3	46.46	14.3	31.4	15.85	56.7
32.6	51.74	64.2	32.8	50.47	44.6	32.3	46.08	14.4	32.4	14.71	56.9

(CONSTANTS OF PARIS CONFERENCE.)

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (HEV.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	1 24	+88 47	Sept.	6 54	+87 11	Sept.	18 03	+86 37	Sept.	19 19	+88 59
	s	″		s	″		s	″		s	″
1.6	51.74	4.2	1.8	50.47	44.6	1.3	46.08	14.4	1.4	74.71	56.9
2.6	52.35	4.5	2.8	50.90	44.4	2.3	45.71	14.5	2.4	73.62	57.1
3.6	52.99	4.8	3.8	51.30	44.2	3.3	45.34	14.6	3.4	72.58	57.3
4.6	53.67	5.0	4.8	51.69	44.0	4.3	44.98	14.7	4.4	71.55	57.5
5.6	54.39	5.3	5.8	52.11	43.9	5.3	44.62	14.8	5.4	70.51	57.7
6.6	55.15	5.6	6.8	52.54	43.7	6.3	44.25	14.9	6.4	69.44	57.9
7 6	55.92	5.9	7.8	52.99	43.5	7.3	43.84	15.1	7.4	68.31	58.2
8.6	56.70	6.2	8 8	53.47	43.3	8.3	43.42	15.2	8.4	67.12	58.4
9.6	57.43	6.5	9.8	53.97	43.1	9.3	42.99	15.3	9.4	65.85	58.7
10 6	58.11	6.9	10.8	54.48	42.9	10.3	42.54	15.4	10.3	64.50	58.9
11.6	58.73	7.2	11.8	55.01	42 8	11.3	42.10	15.5	11.3	63.13	59.1
12.6	59.26	7.6	12.8	55.53	42.7	12.3	41.67	15.5	12.3	61.76	59.2
13.6	59.75	7.9	13.8	56.02	42.6	13.3	41.23	15.5	13.3	60.41	59.4
14.6	60.18	8.3	14.8	56.52	42.5	14.3	40.82	15.5	14.3	59.11	59.5
15.6	60.62	8.6	15.8	56.97	42.4	15.3	40.42	15.6	15.3	57.83	59.7
16.6	61.08	8.9	16.8	57.43	42.3	16.3	40.03	15.6	16.3	56.62	59.8
17.6	61.57	9.2	17.8	57.88	42.2	17.3	39.65	15.6	17.3	55.43	59.9
18.6	62.09	9.6	18.8	58.35	42.0	18.3	39.27	15.7	18.3	54.25	60.1
19.6	62.68	9.9	19.8	58.79	41.9	19.3	38.88	15.7	19.3	53.04	60.3
20.6	63.27	10.2	20.8	59.28	41.8	20.3	38.46	15.8	20.3	51.79	60.4
21.5	63.90	10.5	21.8	59.79	41.6	21.3	38.04	15.8	21.3	50.48	60.6
22.5	64.49	10.9	22.8	60.32	41.5	22.2	37.58	15.9	22.3	49.10	60.8
23.5	65.03	11.3	23.8	60.88	41.4	23.2	37.10	15.9	23.3	47.64	61.0
24.5	65.53	11.7	24.8	61.45	41.3	24.2	36.63	15.9	24.3	46.13	61.1
25.5	65.94	12.1	25.8	62.02	41.2	25.2	36.16	15.9	25.3	44.60	61.2
26.5	66.29	12.5	26.8	62.56	41.1	26.2	35.69	15.9	26.3	43.09	61.3
27.5	66.58	12.9	27.8	63.10	41.1	27.2	35.25	15.9	27.3	41.58	61.4
28.5	66.84	13.2	28.8	63.60	41.1	28.2	34.83	15.8	28.3	40.16	61 5
29.5	67.09	13.6	29.8	64.11	41.0	29.2	34.42	15 8	29.3	38.80	61.6
30.5	67.36	13.9	30.8	64.58	41.0	30.2	34.03	15.7	30.3	37.47	61.6
31.5	67.66	14.2	31.7	65.04	40.9	31.2	33.64	15.7	31.3	36.20	61.7

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	a Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	∂ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	1 25	+88 47	Oct.	6 55	+87 11	Oct.	18 03	+86 37	Oct.	19 18	+89 00
	s	″		s	″		s	″		s	″
1.5	7.66	14.2	1.7	5.04	40.9	1.2	33.64	15.7	1.3	96.20	1 7
2.5	8.00	14.6	2.7	5.51	40.9	2.2	33.26	15.7	2.3	94.94	1.8
3.5	8.38	14.9	3.7	6.00	40.8	3.2	32.87	15.6	3.3	93.66	1.9
4.5	8.80	15.3	4.7	6.51	40.7	4.2	32.46	15.6	4.3	92.33	2.0
5.5	9.19	15.6	5.7	7.03	40.6	5.2	32.04	15.6	5.3	90.94	2.2
6.5	9.58	16.0	6.7	7.57	40.6	6.2	31.60	15.6	6.3	89.50	2.3
7.5	9.89	16.4	7.7	8.13	40.5	7.2	31.15	15.6	7.3	88.01	2.4
8.5	10.14	16.8	8.7	8.70	40.5	8.2	30.70	15.5	8.3	86.46	2.5
9.5	10.32	17.2	9.7	9.26	40.5	9.2	30.24	15.4	9.3	84.91	2.5
10.5	10.44	17.6	10.7	9.80	40.5	10 2	29.81	15.3	10.3	83.38	2.5
11.5	10.51	18.0	11.7	10.33	40.6	11.2	29.39	15.2	11.3	81.90	2.6
12.5	10.54	18.4	12.7	10.84	40.6	12.2	29.00	15.1	12.3	80.46	2.6
13.5	10.59	18.7	13.7	11.31	40.6	13.2	28.62	15.0	13.3	79.09	2.6
14.5	10.66	19.1	14.7	11.80	40.6	14.2	28.25	14.9	14.3	77.77	2.6
15.5	10.77	19.4	15.7	12.28	40.6	15.2	27.88	14.8	15 3	76.44	2.6
16.5	10.92	19.8	16.7	12.75	40.6	16.2	27.50	14.7	16 2	75.14	2.6
17.5	11.11	20.1	17.7	13.25	40.6	17.2	27.10	14.6	17.2	73.80	2.7
18.5	11.31	20.5	18.7	13.77	40.6	18.2	26.71	14.6	18.2	72.40	2.7
19.5	11.51	20.9	19.7	14.32	40.6	19.2	26.29	14.5	19.2	70.94	2.8
20.5	11.67	21.3	20.7	14.88	40.6	20.2	25.86	14.4	20.2	69 42	2.8
21.5	11.77	21.7	21.7	15.44	40.6	21.2	25.41	14.3	21.2	67.86	2.8
22.5	11.81	22.1	22.7	16.01	40.7	22.2	24.96	14.1	22.2	66.26	2.8
23.5	11.76	22.5	23.7	16.57	40.8	23.2	24.53	14.0	23.2	64.68	2.8
24.5	11.65	22.9	24.7	17.11	40.9	24.2	24.11	13.8	24.2	63.13	2.8
25.5	11.48	23.3	25.7	17.63	41.0	25.2	23.73	13.6	25.2	61.63	2.7
26.5	11.32	23.6	26.7	18.12	41.1	26.2	23.36	13.4	26.2	60.20	2.6
27.5	11.15	24.0	27.7	18.60	41.1	27.2	23.01	13.2	27.2	58.86	2.6
28.4	11.01	24.3	28.7	19 05	41.2	28.1	22.67	13.1	28.2	57.54	2.5
29.4	10.91	24.7	29.7	19.49	41.3	29.1	22.34	12.9	29.2	56.28	2.5
30.4	10.85	25.0	30.7	19.95	41.4	30.1	21.99	12.8	30.2	55.00	2.4
31.4	10.80	25.4	31.7	20.42	41.4	31.1	21.65	12.6	31.2	53.69	2.4
32.4	10.78	25.7	32.7	20.91	41.5	32.1	21.29	12.5	32.2	52.39	2.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Ursæ Minoris (*Polaris*). Right Ascension.	Declination North.	Mean Solar Date.	51 Cephei (HEV.) Right Ascension.	Declination North.	Mean Solar Date.	*δ* Ursæ Minoris. Right Ascension.	Declination North.	Mean Solar Date.	*λ* Ursæ Minoris. Right Ascension.	Declination North.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	1 24	+88 47	Nov.	6 55	+87 11	Nov.	18 03	+86 37	Nov.	19 18	+88 59
	s	″		s	″		s	″		s	″
1.4	70.78	25.7	1.7	20.91	41.5	1.1	21.29	12.5	1.2	52.39	62.4
2.4	70.73	26.1	2.7	21.42	41.5	2.1	20.92	12.4	2.2	50.99	62.3
3.4	70.62	26.4	3.7	21.93	41.6	3.1	20.53	12.2	3.2	49.54	62.3
4.4	70.48	26.8	4.7	22.46	41.7	4.1	20.14	12.0	4.2	48.06	62.2
5.4	70.25	27.2	5.7	23.00	41.8	5.1	19.76	11.8	5.2	46.57	62.2
6.4	69.94	27.6	6.6	23.51	42.0	6.1	19.39	11.6	6.2	45.11	62.1
7.4	69.59	28.0	7.6	24.00	42.1	7.1	19.04	11.3	7.2	43.69	62.0
8.4	69.17	28.4	8.6	24.47	42.3	8.1	18.71	11.1	8.2	42.32	61.8
9.4	68.77	28.7	9.6	24.91	42.5	9.1	18.42	10.8	9.2	41.01	61.7
10.4	68.39	29.0	10.6	25.33	42.6	10.1	18.12	10.6	10.2	39.78	61.5
11.4	68.04	29.4	11.6	25.74	42.8	11.1	17.83	10.4	11.2	38.59	61.4
12.4	67.73	29.7	12.6	26.16	42.9	12.1	17.55	10.1	12.2	37.40	61.3
13.4	67.46	30.0	13.6	26.58	43.0	13.1	17.26	9.9	13.2	36.21	61.2
14.4	67.21	30.3	14.6	27.02	43.1	14.1	16.96	9.7	14.2	34.98	61.1
15.4	66.95	30.6	15.6	27.48	43.3	15.1	16.64	9.5	15.2	33.71	61.0
16.4	66.68	31.0	16.6	27.96	43.4	16.1	16.31	9.3	16.2	32.38	60.9
17.4	66.36	31.4	17.6	28.44	43.6	17.1	15.96	9.1	17.2	31.01	60.8
18.4	65.95	31.7	18.6	28.94	43.7	18.1	15.63	8.9	18.2	29.60	60.6
19.4	65.49	32.1	19.6	29.42	43.9	19.1	15.30	8.6	19.2	28.20	60.5
20.4	64.96	32.4	20.6	29.88	44.1	20.1	14.98	8.3	20.1	26.84	60.3
21.4	64.38	32.8	21.6	30.32	44.4	21.1	14.70	8.0	21.1	25.54	60.1
22.4	63.77	33.1	22.6	30.72	44.6	22.1	14.43	7.7	22.1	24.29	59.9
23.4	63.14	33.4	23.6	31.11	44.8	23.1	14.20	7.4	23.1	23.14	59.7
24.4	62.55	33.7	24.6	31.47	45.1	24.1	13.97	7.1	24.1	22.06	59.5
25.4	61.98	34.0	25.6	31.82	45.3	25.1	13.76	6.8	25.1	21.03	59.3
26.4	61.47	34.2	26.6	32.16	45.5	26.1	13.55	6.6	26.1	20.04	59.1
27.4	60.97	34.5	27.6	32.52	45.6	27.1	13.33	6.3	27.1	19.03	58.9
28.4	60.51	34.8	28.6	32.87	45.8	28.1	13.12	6.1	28.1	18.00	58.8
29.4	60.04	35.1	29.6	33.26	46.0	29.1	12.88	5.8	29.1	16.93	58.6
30.4	59.53	35.4	30.6	33.66	46.2	30.1	12.64	5.6	30.1	15.81	58.4
31.4	58.97	35.7	31.6	34.05	46.4	31.1	12.39	5.3	31.1	14.65	58.2

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris (*Polaris*).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension.	Declination *North*.		Right Ascension	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	1 24	+88 47	Dec.	6 55	+87 11	Dec.	18 03	+86 36	Dec.	19 17	+88 59
	s	″		s	″		s	″		s	″
1.4	58.97	35.7	1.6	34.05	46.4	1.1	12.39	65.3	1.1	74.65	58.2
2.4	58.34	36.0	2.6	34.45	46.6	2.1	12.14	65.0	2.1	73.48	58.0
3.3	57.64	36.3	3.6	34.83	46.9	3.1	11.92	64.7	3.1	72.33	57.8
4.3	56.87	36.6	4.6	35.19	47.2	4.0	11.70	64.3	4.1	71.22	57.6
5.3	56.07	36.9	5.6	35.53	47.5	5.0	11.51	64.0	5.1	70.18	57.3
6.3	55.23	37.2	6.6	35.84	47.7	6.0	11.35	63.6	6.1	69.21	57.0
7.3	54.42	37.4	7.6	36.12	48.0	7.0	11.20	63.3	7.1	68.33	56.8
8.3	53.64	37.6	8.6	36.39	48.3	8.0	11.07	62.9	8.1	67.50	56.5
9.3	52.91	37.8	9.6	36.66	48.5	9.0	10.94	62.6	9.1	66.71	56.2
10.3	52.21	38.0	10.6	36.92	48.8	10.0	10.81	62.3	10.1	65.92	56.0
11.3	51.54	38.2	11.6	37.19	49.0	11.0	10.68	62.0	11.1	65.13	55.8
12.3	50.90	38.5	12.5	37.48	49.2	12.0	10.52	61.8	12.1	64.29	55.6
13.3	50.26	38.7	13.5	37.79	49.5	13.0	10.36	61.5	13.1	63.40	55.3
14.3	49.55	39.0	14.5	38.10	49.7	14.0	10.19	61.2	14.1	62.47	55.1
15.3	48.80	39.2	15.5	38.42	50.0	15.0	10.02	60.9	15.1	61.52	54.9
16.3	47.99	39.5	16.5	38.74	50.3	16.0	9.86	60.5	16.1	60.56	54.6
17.3	47.09	39.7	17.5	39.04	50.6	17.0	9.71	60.2	17.1	59.65	54.3
18.3	46.15	40.0	18.5	39.30	50.9	18.0	9.57	59.8	18.1	58.78	54.0
19.3	45.16	40.2	19.5	39.54	51.2	19.0	9.47	59.5	19.1	57.97	53.7
20.3	44.20	40.4	20.5	39.74	51.6	20.0	9.39	59.1	20.1	57.27	53.4
21.3	43.24	40.5	21.5	39.93	51.9	21.0	9.35	58.7	21.1	56.67	53.1
22.3	42.31	40.7	22.5	40.09	52.2	22.0	9.31	58.4	22.1	56.14	52.8
23.3	41.43	40.8	23.5	40.24	52.5	23.0	9.28	58.0	23.1	55.64	52.5
24.3	40.60	40.9	24.5	40.39	52.7	24.0	9.25	57.7	24.1	55.15	52.2
25.3	39.79	41.1	25.5	40.55	53.0	25.0	9.22	57.4	25.1	54.66	51.9
26.3	38.99	41.2	26.5	40.72	53.3	26.0	9.16	57.1	26.0	54.13	51.6
27.3	38.17	41.4	27.5	40.90	53.5	27.0	9.11	56.8	27.0	53.57	51.4
28.3	37.32	41.6	28.5	41.09	53.8	28.0	9.05	56.5	28.0	52.97	51.1
29.3	36.41	41.7	29.5	41.30	54.1	29.0	9.00	56.2	29.0	52.37	50.8
30.3	35.42	41.9	30.5	41.47	54.5	30.0	8.95	55.8	30.0	51.77	50.5
31.3	34.38	42.1	31.5	41.62	54.8	31.0	8.91	55.5	31.0	51.21	50.2
32.3	33.30	42.2	32.5	41.75	55.2	32.0	8.90	55.1	32.0	50.71	49.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	43 Cephei (H.) Right Ascension	43 Cephei (H.) Declination North	μ Hydri Right Ascension	μ Hydri Declination South	47 Cephei (H.) Right Ascension	47 Cephei (H.) Declination North	δ Mensæ Right Ascension	δ Mensæ Declination South	Groombridge 944 Right Ascension	Groombridge 944 Declination North
	h m	° '	h m	° '	h m	° '	h m	° '	h m	° '
	0 55	+85 43	2 33	−79 31	2 53	+79 01	4 24	−80 26	5 30	+85 08
	s	"	s	"	s	"	s	"	s	"
Jan. 0.4	26.14 (2.80)	76.6 (0.4)	45.42 (1.17)	92.0 (0.9)	10.02 (0.79)	68.8 (1.7)	40.13 (1.00)	53.3 (2.4)	52.33 (0.44)	53.5 (3.1)
10.3	23.34 (2.80)	77.0 (0.2)	44.25 (1.24)	92.9 (0.4)	9.23 (0.92)	70.5 (1.2)	39.13 (1.16)	55.7 (2.0)	51.89 (0.93)	56.6 (2.8)
20.3	20.54 (2.80)	76.8 (0.8)	43.01 (1.25)	93.3 (0.3)	8.31 (1.01)	71.7 (0.7)	37.97 (1.30)	57.7 (1.5)	50.96 (1.39)	59.4 (2.6)
30.3	17.83 (2.71)	76.0 (0.8)	41.76 (1.25)	93.0 (0.8)	7.30 (1.05)	72.4 (0.0)	36.67 (1.41)	59.2 (0.9)	49.57 (1.79)	62.0 (2.0)
Feb. 9.2	15.31 (2.52)	74.5 (1.5)	40.51 (1.21)	92.2 (1.4)	6.25 (1.04)	72.4 (0.6)	35.26 (1.46)	60.1 (0.3)	47.78 (2.10)	64.0 (1.6)
19.2	13.10 (2.21 / 1.82)	72.5 (2.0 / 2.5)	39.30 (1.14)	90.8 (1.9)	5.21 (1.00)	71.8 (1.2)	33.80 (1.48)	60.4 (0.2)	45.68 (2.34)	65.6 (1.1)
Mar. 1.2	11.28 (1.36)	70.0 (2.8)	38.16 (1.03)	88.9 (2.4)	4.21 (0.92)	70.6 (1.7)	32.32 (1.47)	60.2 (0.7)	43.34 (2.46)	66.7 (0.4)
11.2	9.92 (0.84)	67.2 (3.1)	37.13 (0.91)	86.5 (2.8)	3.29 (0.78)	68.9 (2.1)	30.85 (1.41)	59.5 (1.3)	40.88 (2.48)	67.1 (0.2)
21.1	9.08 (0.31)	64.1 (3.2)	36.22 (0.76)	83.7 (3.1)	2.51 (0.62)	66.8 (2.5)	29.44 (1.32)	58.2 (1.8)	38.40 (2.40)	66.9 (0.8)
31.1	8.77 (0.25)	60.9 (3.1)	35.46 (0.60)	80.6 (3.4)	1.89 (0.43)	64.3 (2.8)	28.12 (1.20)	56.4 (2.1)	36.00 (2.22)	66.1 (1.3)
Apr. 10.1	9.02 (0.80)	57.8 (3.0)	34.86 (0.41)	77.2 (3.5)	1.46 (0.22)	61.5 (2.9)	26.92 (1.05)	54.3 (2.6)	33.78 (1.95)	64.8 (1.8)
20.1	9.82 (1.31)	54.8 (2.8)	34.45 (0.23)	73.7 (3.6)	1.24 (0.00)	58.6 (2.9)	25.87 (0.88)	51.7 (2.9)	31.83 (1.62)	63.0 (2.3)
30.0	11.13 (1.77)	52.0 (2.4)	34.22 (0.03)	70.1 (3.7)	1.24 (0.22)	55.7 (2.9)	24.99 (0.69)	48.8 (3.1)	30.21 (1.23)	60.7 (2.6)
May 10.0	12.90 (2.16)	49.6 (2.0)	34.19 (0.17)	66.4 (3.6)	1.46 (0.42)	52.8 (2.7)	24.30 (0.47)	45.7 (3.3)	28.98 (0.79)	58.1 (2.8)
20.0	15.06 (2.49)	47.6 (1.6)	34.36 (0.36)	62.8 (3.5)	1.88 (0.63)	50.1 (2.5)	23.83 (0.26)	42.4 (3.4)	28.19 (0.34)	55.3 (3.0)
29.9	17.55 (2.74)	46.0 (1.0)	34.72 (0.55)	59.3 (3.2)	2.51 (0.80)	47.6 (2.1)	23.57 (0.03)	39.0 (3.4)	27.85 (0.13)	52.3 (3.0)
June 8.9	20.29 (2.91)	45.0 (0.4)	35.27 (0.72)	56.1 (2.9)	3.31 (0.96)	45.5 (1.7)	23.54 (0.20)	35.6 (3.4)	27.98 (0.13 / 0.58)	49.3 (3.0)
18.9	23.20 (3.01)	44.6 (0.4)	35.99 (0.87)	53.2 (2.5)	4.27 (1.08)	43.8 (1.3)	23.74 (0.41)	32.2 (3.4)	28.56 (1.02)	46.3 (3.0)
28.9	26.21 (3.01)	44.7 (0.6)	36.86 (1.00)	50.7 (2.1)	5.35 (1.18)	42.5 (0.8)	24.15 (0.61)	29.0 (3.2)	29.58 (1.44)	43.4 (2.9)
July 8.8	29.22 (2.94)	45.3 (1.2)	37.86 (1.09)	48.6 (1.6)	6.53 (1.25)	41.7 (0.4)	24.76 (0.81)	26.0 (3.0)	31.02 (1.81)	40.7 (2.7 / 2.5)
18.8	32.16 (2.82)	46.5 (1.7)	38.95 (1.16)	47.0 (1.0)	7.78 (1.29)	41.3 (0.2)	25.57 (0.98)	23.4 (2.2)	32.83 (2.14)	38.2 (2.1)
28.8	34.98 (2.63)	48.2 (2.1)	40.11 (1.19)	46.0 (0.5)	9.07 (1.30)	41.5 (0.6)	26.55 (1.11)	21.2 (1.8)	34.97 (2.42)	36.1 (1.8)
Aug. 7.8	37.61 (2.37)	50.3 (2.6)	41.30 (1.19)	45.5 (0.2)	10.37 (1.29)	42.1 (1.1)	27.66 (1.21)	19.4 (1.3)	37.39 (2.66)	34.3 (1.4)
17.7	39.98 (2.08)	52.9 (3.0)	42.49 (1.14)	45.7 (0.8)	11.66 (1.25)	43.2 (1.5)	28.87 (1.28)	18.1 (0.6)	40.05 (2.83)	32.9 (1.0)
27.7	42.06 (1.75)	55.9 (3.2)	43.63 (1.06)	46.5 (1.3)	12.91 (1.18)	44.7 (2.0)	30.15 (1.30)	17.5 (0.1)	42.88 (2.96)	31.9 (0.5)
Sept. 6.7	43.81 (1.38)	59.1 (3.5)	44.69 (0.94)	47.8 (1.9)	14.09 (1.10)	46.7 (2.3)	31.45 (1.29)	17.4 (0.6)	45.84 (3.02)	31.4 (0.1)
16.6	45.19 (0.97)	62.6 (3.7)	45.63 (0.79)	49.7 (2.4)	15.19 (0.99)	49.0 (2.6)	32.74 (1.22)	18.0 (1.2)	48.86 (3.03)	31.3 (0.4)
26.6	46.16 (0.56)	66.3 (3.7)	46.42 (0.61)	52.1 (2.8)	16.18 (0.86)	51.6 (3.0)	33.96 (1.11)	19.2 (1.8)	51.89 (2.97)	31.7 (0.8)
Oct. 6.6	46.72 (0.11)	70.0 (3.8)	47.03 (0.41)	54.9 (3.1)	17.04 (0.73)	54.6 (3.1)	35.07 (0.97)	21.0 (2.3)	54.86 (2.86)	32.5 (1.3)
16.6	46.83 (0.33)	73.8 (3.7)	47.44 (0.20)	58.0 (3.3)	17.77 (0.57)	57.7 (3.3)	36.04 (0.79)	23.3 (2.7)	57.72 (2.68)	33.8 (1.7)
26.5	46.50 (0.78)	77.5 (3.5)	47.64 (0.03)	61.3 (3.3)	18.34 (0.39)	61.0 (3.3)	36.83 (0.58)	26.0 (3.1)	60.40 (2.44)	35.5 (2.1)
Nov. 5.5	45.72 (1.21)	81.0 (3.2)	47.61 (0.25)	64.6 (3.3)	18.73 (0.21)	64.3 (3.4)	37.41 (0.34)	29.1 (3.4)	62.84 (2.13)	37.6 (2.4)
15.5	44.51 (1.62)	84.2 (3.0)	47.36 (0.47)	67.9 (3.1)	18.94 (0.02)	67.7 (3.3)	37.75 (0.09)	32.5 (3.4)	64.97 (1.76)	40.0 (2.8)
25.5	42.89 (2.01)	87.2 (2.5)	46.89 (0.66)	71.0 (2.7)	18.96 (0.17)	71.0 (3.1)	37.84 (0.16)	35.9 (3.4)	66.73 (1.35)	42.8 (3.0)
Dec. 5.4	40.88 (2.33)	89.7 (2.0)	46.23 (0.84)	73.7 (2.4)	18.79 (0.37)	74.1 (2.9)	37.68 (0.41)	39.3 (3.3)	68.08 (0.88)	45.8 (3.2)
15.4	38.55 (2.57)	91.7 (1.4)	45.39 (1.00)	76.1 (1.9)	18.42 (0.55)	77.0 (2.5)	37.27 (0.65)	42.6 (3.1)	68.96 (0.38)	49.0 (3.2)
25.4	35.98 (2.76)	93.1 (0.9)	44.39 (1.10)	78.0 (1.3)	17.87 (0.71)	79.5 (2.0)	36.62 (0.87)	45.7 (2.7)	69.34 (0.13)	52.2 (3.2)
35.3	33.22	94.0	43.29	79.3	17.16	81.5	35.75	48.4	69.21	55.4

(CONSTANTS OF PARIS CONFERENCE.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Mensæ. Right Ascension.	ζ Mensæ. Declination South.	25 Camelopardalis. Right Ascension.	25 Camelopardalis. Declination North.	I Draconis (H.). Right Ascension.	I Draconis (H.). Declination North.	ζ Chamæleontis. Right Ascension.	ζ Chamæleontis. Declination South.	δ² Chamæleontis. Right Ascension.	δ² Chamæleontis. Declination South.
	h m 6 48	° ′ −80 42	h m 7 10	+82 35	h m 9 23	+81 44	h m 9 36	−80 29	h m 10 44	−80 01
	s	″	s	″	s	″	s	″	s	″
Jan. 0.6	20.46 (0.27)	44.9 (3.6)	41.78 (0.48)	52.1 (2.9)	15.58 (1.19)	73.8 (2.0)	54.77 (0.76)	57.6 (3.4)	58.57 (1.06)	13.3 (2.7)
10.6	20.19 (0.52)	48.5 (3.5)	42.26 (0.12)	55.0 (3.1)	16.77 (0.94)	75.8 (2.5)	55.53 (0.54)	61.0 (3.6)	59.63 (0.88)	16.0 (3.2)
20.5	19.67 (0.76)	52.0 (3.2)	42.38 (0.22)	58.1 (3.0)	17.71 (0.65)	78.3 (2.7)	56.07 (0.30)	64.6 (3.8)	60.51 (0.70)	19.2 (3.5)
30.5	18.91 (0.97)	55.2 (2.9)	42.16 (0.56)	61.1 (2.8)	18.36 (0.35)	81.0 (3.0)	56.37 (0.07)	68.4 (3.9)	61.21 (0.49)	22.7 (3.8)
Feb. 9.5	17.94 (1.16)	58.1 (2.6)	41.60 (0.86)	63.9 (2.5)	18.71 (0.04)	84.0 (3.1)	56.44 (0.17)	72.3 (3.9)	61.70 (0.28)	26.5 (3.8)
19.5	16.78 (1.30)	60.7 (2.0)	40.74 (1.13)	66.4 (2.2)	18.75 (0.26)	87.1 (3.0)	56.27 (0.38)	76.2 (3.7)	61.98 (0.07)	30.3 (3.9)
Mar. 1.4	15.48 (1.41)	62.7 (1.6)	39.61 (1.35)	68.6 (1.7)	18.49 (0.55)	90.1 (2.9)	55.89 (0.59)	79.9 (3.5)	62.05 (0.14)	34.2 (3.9)
11.4	14.07 (1.48)	64.3 (1.1)	38.26 (1.49)	70.3 (1.1)	17.94 (0.81)	93.0 (2.6)	55.30 (0.77)	83.4 (3.3)	61.91 (0.33)	38.1 (3.7)
21.4	12.59 (1.52)	65.4 (0.5)	36.77 (1.58)	71.4 (0.6)	17.13 (1.03)	95.6 (2.2)	54.53 (0.93)	86.7 (2.9)	61.58 (0.51)	41.8 (3.5)
31.3	11.07 (1.51)	65.9 (0.1)	35.19 (1.60)	72.0 (0.1)	16.10 (1.20)	97.8 (1.7)	53.60 (1.06)	89.6 (2.5)	61.07 (0.66)	45.3 (3.2)
Apr. 10.3	9.56 (1.46)	66.0 (0.5)	33.59 (1.55)	72.1 (0.6)	14.90 (1.31)	99.5 (1.2)	52.54 (1.16)	92.1 (2.1)	60.41 (0.81)	48.5 (2.8)
20.3	8.10 (1.40)	65.5 (1.0)	32.04 (1.45)	71.5 (1.1)	13.59 (1.38)	100.7 (0.7)	51.38 (1.23)	94.2 (1.6)	59.60 (0.92)	51.3 (2.4)
30.3	6.70 (1.28)	64.5 (1.4)	30.59 (1.28)	70.4 (1.6)	12.21 (1.38)	101.4 (0.1)	50.15 (1.28)	95.8 (1.1)	58.68 (1.01)	53.7 (2.0)
May 10.2	5.42 (1.15)	63.1 (1.9)	29.31 (1.08)	68.8 (2.0)	10.83 (1.35)	101.5 (0.4)	48.87 (1.28)	96.9 (0.5)	57.67 (1.08)	55.7 (1.4)
20.2	4.27 (0.98)	61.2 (2.3)	28.23 (0.84)	66.8 (2.4)	9.48 (1.27)	101.1 (1.0)	47.59 (1.26)	97.4 (0.0)	56.59 (1.13)	57.1 (0.9)
30.2	3.29 (0.80)	58.9 (2.6)	27.39 (0.58)	64.4 (2.7)	8.21 (1.14)	100.1 (1.5)	46.33 (1.22)	97.4 (0.6)	55.46 (1.15)	58.0 (0.4)
June 9.2	2.49 (0.59)	56.3 (2.9)	26.81 (0.29)	61.7 (2.9)	7.07 (0.99)	98.6 (2.0)	45.11 (1.14)	96.8 (1.1)	54.31 (1.12)	58.4 (0.2)
19.1	1.90 (0.37)	53.4 (3.1)	26.52 (0.01)	58.8 (3.1)	6.08 (0.81)	96.6 (2.4)	43.97 (1.03)	95.7 (1.6)	53.19 (1.09)	58.2 (0.7)
29.1	1.53 (0.14)	50.3 (3.2)	26.51 (0.27)	55.7 (3.1)	5.27 (0.60)	94.2 (2.7)	42.94 (0.89)	94.1 (2.0)	52.10 (1.01)	57.5 (1.3)
July 9.1	1.39 (0.09)	47.1 (3.2)	26.78 (0.55)	52.6 (3.0)	4.67 (0.38)	91.5 (3.0)	42.05 (0.73)	92.1 (2.5)	51.09 (0.92)	56.2 (1.7)
19.0	1.48 (0.32)	43.9 (3.1)	27.33 (0.82)	49.6 (3.0)	4.29 (0.17)	88.5 (3.2)	41.32 (0.55)	89.6 (2.7)	50.17 (0.78)	54.5 (2.2)
29.0	1.80 (0.55)	40.8 (3.0)	28.15 (1.06)	46.6 (2.8)	4.12 (0.07)	85.3 (3.4)	40.77 (0.34)	86.9 (3.0)	49.39 (0.62)	52.3 (2.6)
Aug. 8.0	2.35 (0.76)	37.8 (2.7)	29.21 (1.29)	43.8 (2.6)	4.19 (0.30)	81.9 (3.4)	40.43 (0.12)	83.9 (3.1)	48.77 (0.45)	49.7 (2.8)
18.0	3.11 (0.95)	35.1 (2.3)	30.50 (1.49)	41.2 (2.3)	4.49 (0.51)	78.5 (3.4)	40.31 (0.11)	80.8 (3.1)	48.32 (0.24)	46.9 (3.1)
27.9	4.06 (1.11)	32.8 (1.8)	31.99 (1.65)	38.9 (2.0)	5.00 (0.73)	75.1 (3.3)	40.42 (0.34)	77.7 (3.1)	48.08 (0.02)	43.8 (3.1)
Sept. 6.9	5.17 (1.23)	31.0 (1.3)	33.64 (1.80)	36.9 (1.6)	5.73 (0.94)	71.8 (3.2)	40.76 (0.56)	74.6 (2.9)	48.06 (0.20)	40.7 (3.1)
16.9	6.40 (1.33)	29.7 (0.7)	35.44 (1.90)	35.3 (1.3)	6.67 (1.13)	68.6 (3.0)	41.32 (0.79)	71.7 (2.5)	48.26 (0.42)	37.6 (3.0)
26.9	7.73 (1.36)	29.0 (0.1)	37.34 (1.98)	34.0 (0.8)	7.80 (1.30)	65.6 (2.7)	42.11 (0.98)	69.2 (2.2)	48.68 (0.65)	34.6 (2.7)
Oct. 6.8	9.09 (1.37)	28.9 (0.6)	39.32 (2.01)	33.2 (0.4)	9.10 (1.45)	62.9 (2.4)	43.09 (1.14)	67.0 (1.6)	49.33 (0.85)	31.9 (2.3)
16.8	10.46 (1.32)	29.5 (1.2)	41.33 (2.00)	32.8 (0.1)	10.55 (1.57)	60.5 (1.9)	44.23 (1.27)	65.4 (1.1)	50.18 (1.03)	29.6 (1.9)
26.8	11.78 (1.21)	30.7 (1.8)	43.33 (1.96)	32.9 (0.6)	12.12 (1.68)	58.6 (1.5)	45.50 (1.36)	64.3 (0.4)	51.21 (1.17)	27.7 (1.3)
Nov. 5.7	12.99 (1.07)	32.5 (2.4)	45.29 (1.86)	33.5 (1.1)	13.80 (1.73)	57.1 (1.0)	46.86 (1.40)	63.9 (0.2)	52.38 (1.29)	26.4 (0.7)
15.7	14.06 (0.88)	34.9 (2.8)	47.15 (1.71)	34.6 (1.5)	15.53 (1.74)	56.1 (0.5)	48.26 (1.39)	64.1 (0.9)	53.67 (1.35)	25.7 (0.0)
25.7	14.94 (0.67)	37.7 (3.2)	48.86 (1.52)	36.1 (2.0)	17.27 (1.72)	55.6 (0.1)	49.65 (1.33)	65.0 (1.5)	55.02 (1.36)	25.7 (0.6)
Dec. 5.7	15.61 (0.43)	40.9 (3.5)	50.38 (1.28)	38.1 (2.4)	18.99 (1.64)	55.7 (0.7)	50.98 (1.21)	66.5 (2.1)	56.38 (1.34)	26.3 (1.2)
15.6	16.04 (0.16)	44.4 (3.6)	51.66 (1.00)	40.5 (2.7)	20.63 (1.50)	56.4 (1.3)	52.19 (1.07)	68.6 (2.7)	57.72 (1.25)	27.5 (1.9)
25.6	16.20 (0.10)	48.0 (3.6)	52.66 (0.68)	43.2 (2.9)	22.13 (1.33)	57.7 (1.7)	53.26 (0.89)	71.3 (3.1)	58.97 (1.14)	29.4 (2.4)
35.6	16.10	51.6	53.34	46.1	23.46	59.4	54.15	74.4	60.11	31.8

FIXED STARS, 1902.

(CONSTANTS OF PARIS CONFERENCE.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Octantis. Right Ascension.	η Octantis. Declination South.	β Chamæleontis. Right Ascension.	β Chamæleontis. Declination South.	6 Ursæ Min. (B.). Right Ascension.	6 Ursæ Min. (B.). Declination North.	32² Camelop. (H.). Right Ascension.	32² Camelop. (H.). Declination North.	κ Octantis. Right Ascension.	κ Octantis. Declination South.
	h m 10 59	° ′ −84 03	h m 12 12	° ′ −78 45	h m 12 13	° ′ +88 13	h m 12 48	° ′ +83 56	h m 13 24	° ′ −85 16
	s	″	s	″	s	″	s	″	s	″
Jan. 0.7	70.36 (1.81)	48.2 (2.6)	39.36 (1.21)	49.6 (1.7)	71.7 (7.2)	70.7 (0.1)	18.84 (2.15)	20.7 (0.5)	64.14 (2.96)	44.0 (0.5)
10.7	72.17 (1.54)	50.8 (2.9)	40.57 (1.13)	51.3 (2.3)	78.9 (7.0)	70.8 (0.7)	20.99 (2.13)	20.2 (0.1)	67.10 (2.93)	44.5 (1.1)
20.7	73.71 (1.24)	53.7 (3.4)	41.70 (1.01)	53.6 (2.7)	85.9 (6.4)	71.5 (1.3)	23.12 (2.04)	20.3 (0.8)	70.03 (2.80)	45.6 (1.6)
30.7	74.95 (0.92)	57.1 (3.6)	42.71 (0.88)	56.3 (3.1)	92.3 (5.6)	72.8 (1.9)	25.16 (1.86)	21.1 (1.4)	72.83 (2.62)	47.2 (2.2)
Feb. 9.6	75.87 (0.58)	60.7 (3.8)	43.59 (0.73)	59.4 (3.4)	97.9 (4.8)	74.7 (2.3)	27.02 (1.63)	22.5 (2.0)	75.45 (2.38)	49.4 (2.6)
19.6	76.45 (0.23)	64.5 (3.9)	44.32 (0.55)	62.8 (3.6)	102.7 (3.5)	77.0 (2.8)	28.65 (1.33)	24.5 (2.4)	77.83 (2.08)	52.0 (3.0)
Mar. 1.6	76.68 (0.10)	68.4 (3.9)	44.87 (0.39)	66.4 (3.8)	106.2 (2.4)	79.8 (3.0)	29.98 (0.99)	26.9 (2.8)	79.91 (1.73)	55.0 (3.3)
11.5	76.58 (0.42)	72.3 (3.8)	45.26 (0.21)	70.2 (3.8)	108.6 (0.9)	82.8 (3.2)	30.97 (0.61)	29.7 (3.1)	81.64 (1.39)	58.3 (3.5)
21.5	76.16 (0.74)	76.1 (3.6)	45.47 (0.05)	74.0 (3.7)	109.5 (0.3)	86.0 (3.2)	31.58 (0.22)	32.8 (3.1)	83.03 (1.00)	61.8 (3.6)
31.5	75.42 (1.00)	79.7 (3.3)	45.52 (0.12)	77.7 (3.6)	109.2 (1.7)	89.2 (3.1)	31.80 (0.17)	35.9 (3.2)	84.03 (0.61)	65.4 (3.7)
Apr. 10.5	74.42 (1.26)	83.0 (3.1)	45.40 (0.28)	81.3 (3.4)	107.5 (2.9)	92.3 (2.9)	31.63 (0.53)	39.1 (3.1)	84.64 (0.22)	69.1 (3.6)
20.4	73.16 (1.48)	86.1 (2.6)	45.12 (0.42)	84.7 (3.2)	104.6 (4.1)	95.2 (2.5)	31.10 (0.87)	42.2 (2.9)	84.86 (0.18)	72.7 (3.6)
30.4	71.68 (1.65)	88.7 (2.2)	44.70 (0.55)	87.9 (2.8)	100.5 (4.9)	97.7 (2.2)	30.23 (1.18)	45.1 (2.5)	84.68 (0.57)	76.3 (3.4)
May 10.4	70.03 (1.80)	90.9 (1.8)	44.15 (0.67)	90.7 (2.4)	95.6 (5.8)	99.9 (1.7)	29.05 (1.44)	47.6 (2.1)	84.11 (0.94)	79.7 (3.1)
20.4	68.23 (1.90)	92.7 (1.2)	43.48 (0.77)	93.1 (2.0)	89.8 (6.3)	101.6 (1.1)	27.61 (1.65)	49.7 (1.6)	83.17 (1.28)	82.8 (2.8)
30.3	66.33 (1.95)	93.9 (0.7)	42.71 (0.85)	95.1 (1.4)	83.5 (6.7)	102.7 (0.6)	25.96 (1.80)	51.3 (1.2)	81.89 (1.60)	85.6 (2.4)
June 9.3	64.38 (1.95)	94.6 (0.1)	41.86 (0.91)	96.5 (1.0)	76.8 (6.8)	103.3 (0.0)	24.16 (1.89)	52.5 (0.6)	80.29 (1.86)	88.0 (1.9)
19.3	62.43 (1.91)	94.7 (0.5)	40.95 (0.95)	97.5 (0.4)	70.0 (5.9)	103.3 (0.6)	22.27 (1.95)	53.1 (0.0)	78.43 (2.09)	89.9 (1.5)
29.2	60.52 (1.81)	94.2 (1.0)	40.00 (0.95)	97.9 (0.2)	63.1 (6.6)	102.7 (1.1)	20.32 (1.95)	53.1 (0.6)	76.34 (2.25)	91.4 (0.9)
July 9.2	58.71 (1.65)	93.2 (1.5)	39.05 (0.94)	97.7 (0.7)	56.5 (6.3)	101.6 (1.6)	18.37 (1.90)	52.5 (1.0)	74.09 (2.35)	92.3 (0.4)
19.2	57.06 (1.45)	91.7 (1.9)	38.11 (0.89)	97.0 (1.2)	50.2 (5.8)	100.0 (2.1)	16.47 (1.80)	51.5 (1.6)	71.74 (2.38)	92.7 (0.2)
29.2	55.61 (1.21)	89.8 (2.4)	37.22 (0.81)	95.8 (1.7)	44.4 (5.1)	97.9 (2.5)	14.67 (1.66)	49.9 (2.1)	69.36 (2.32)	92.5 (0.7)
Aug. 8.1	54.40 (0.90)	87.4 (2.7)	36.41 (0.70)	94.1 (2.2)	39.3 (4.4)	95.4 (3.0)	13.01 (1.50)	47.8 (2.5)	67.04 (2.20)	91.8 (1.3)
18.1	53.50 (0.58)	84.7 (3.0)	35.71 (0.57)	91.9 (2.5)	34.9 (3.6)	92.4 (3.2)	11.51 (1.30)	45.3 (2.9)	64.84 (1.98)	90.5 (1.9)
28.1	52.92 (0.21)	81.7 (3.1)	35.14 (0.41)	89.4 (2.9)	31.3 (2.7)	89.2 (3.5)	10.21 (1.06)	42.4 (3.3)	62.86 (1.69)	88.6 (2.2)
Sept. 7.1	52.71 (0.17)	78.6 (3.2)	34.73 (0.22)	86.5 (3.0)	28.6 (1.7)	85.7 (3.7)	9.15 (0.79)	39.1 (3.5)	61.17 (1.33)	86.4 (2.7)
17.0	52.88 (0.55)	75.4 (3.0)	34.51 (0.03)	83.5 (3.1)	26.9 (0.6)	82.0 (3.8)	8.36 (0.52)	35.6 (3.6)	59.84 (0.91)	83.7 (2.9)
27.0	53.43 (0.93)	72.4 (2.9)	34.48 (0.19)	80.4 (3.0)	26.3 (0.4)	78.2 (3.8)	7.84 (0.21)	32.0 (3.8)	58.93 (0.44)	80.8 (3.1)
Oct. 7.0	54.36 (1.28)	69.5 (2.5)	34.67 (0.39)	77.4 (2.9)	26.7 (1.4)	74.4 (3.7)	7.63 (0.11)	28.2 (3.8)	58.49 (0.06)	77.7 (3.2)
16.9	55.64 (1.59)	67.0 (2.1)	35.06 (0.60)	74.5 (2.6)	28.1 (2.5)	70.7 (3.6)	7.74 (0.43)	24.4 (3.8)	58.55 (0.57)	74.5 (3.1)
26.9	57.23 (1.86)	64.9 (1.6)	35.66 (0.79)	71.9 (2.3)	30.6 (3.6)	67.1 (3.4)	8.17 (0.75)	20.6 (3.6)	59.12 (1.08)	71.4 (2.9)
Nov. 5.9	59.09 (2.06)	63.3 (1.0)	36.45 (0.96)	69.6 (1.7)	34.2 (4.5)	63.7 (3.1)	8.92 (1.07)	17.0 (3.4)	60.20 (1.56)	68.5 (2.6)
15.9	61.15 (2.18)	62.3 (0.3)	37.41 (1.09)	67.9 (1.2)	38.7 (5.3)	60.6 (2.6)	9.99 (1.37)	13.6 (3.1)	61.76 (1.98)	65.9 (2.2)
25.8	63.33 (2.23)	62.0 (0.3)	38.50 (1.19)	66.7 (0.6)	44.0 (6.2)	58.0 (2.2)	11.36 (1.63)	10.5 (2.7)	63.74 (2.34)	63.7 (1.7)
Dec. 5.8	65.56 (2.21)	62.3 (0.9)	39.69 (1.25)	66.1 (0.0)	50.2 (6.7)	55.8 (1.6)	12.99 (1.86)	7.8 (2.1)	66.08 (2.62)	62.0 (1.2)
15.8	67.77 (2.10)	63.2 (1.6)	40.94 (1.26)	66.1 (0.7)	56.9 (7.0)	54.2 (1.0)	14.85 (2.04)	5.7 (1.6)	68.70 (2.82)	60.8 (0.5)
25.8	69.87 (1.92)	64.8 (2.2)	42.20 (1.24)	66.8 (1.3)	63.9 (7.3)	53.2 (0.4)	16.89 (2.13)	4.1 (0.9)	71.52 (2.92)	60.3 (0.1)
35.7	71.79	67.0	43.44	68.1	71.2	52.8	19.02	3.2	74.44	60.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Values are given as main value followed by interline difference in parentheses.

Mean Solar Date.	δ Octantis. Right Ascension (h m 14 11)	δ Octantis. Declination South (−83 12)	ρ Octantis. Right Ascension (15 20)	ρ Octantis. Declination South (−84 08)	γ Apodis. Right Ascension (16 18)	γ Apodis. Declination South (−78 40)	ε Ursæ Minoris. Right Ascension (16 55)	ε Ursæ Minoris. Declination North (+82 11)	σ Octantis. Right Ascension (19)	σ Octantis. Declination South (−89 14)
	s	''	s	''	s	''	s	''	m s	''
Jan. 0.9	11.11 (2.09)	50.3 (0.2)	35.25 (2.23)	2.6 (1.3)	21.89 (1.05)	22.6 (1.8)	48.06 (0.69)	53.7 (3.2)	1 37.4 (3.9)	59.5 (3.5)
10.9	13.20 (2.14)	50.1 (0.4)	37.48 (2.40)	1.3 (0.7)	22.94 (1.18)	20.8 (1.4)	48.75 (0.97)	50.5 (2.9)	1 41.3 (6.9)	56.0 (3.3)
20.9	15.34 (2.12)	50.5 (1.0)	39.88 (2.50)	0.6 (0.1)	24.12 (1.28)	19.4 (0.9)	49.72 (1.20)	47.6 (2.4)	1 48.2 (9.7)	52.7 (3.2)
30.8	17.46 (2.05)	51.5 (1.5)	42.38 (2.54)	0.5 (0.4)	25.40 (1.34)	18.5 (0.4)	50.92 (1.39)	45.2 (1.9)	1 57.9 (12.3)	49.5 (2.9)
Feb. 9.8	19.51 (1.92)	53.0 (2.1)	44.92 (2.50)	0.9 (1.0)	26.74 (1.36)	18.1 (0.1)	52.31 (1.54)	43.3 (1.3)	2 10.2 (14.1)	46.6 (2.6)
19.8	21.43 (1.77)	55.1 (2.4)	47.42 (2.41)	1.9 (1.4)	28.10	18.2 (0.5)	53.85 (1.61)	42.0 (0.6)	2 24.6 (16.2)	44.0 (2.1)
Mar. 1.8	23.20 (1.57)	57.5 (2.8)	49.83 (2.27)	3.3 (1.9)	29.46 (1.36)	18.7 (1.0)	55.46 (1.63)	41.4 (0.0)	2 40.8 (17.5)	41.9 (1.8)
11.7	24.77 (1.36)	60.3 (3.1)	52.10 (2.09)	5.2 (2.2)	30.78 (1.32)	19.7 (1.4)	57.09 (1.59)	41.4 (0.6)	2 58.3 (18.4)	40.1 (1.3)
21.7	26.13 (1.11)	63.4 (3.3)	54.19 (1.88)	7.4 (2.6)	32.05 (1.27)	21.1 (1.8)	58.68 (1.50)	42.0 (1.3)	3 16.7 (19.0)	38.8 (0.8)
31.7	27.24 (0.85)	66.7 (3.5)	56.07 (1.62)	10.0 (2.9)	33.24 (1.19)	22.9 (2.1)	60.18 (1.34)	43.3 (1.9)	3 35.7 (19.1)	38.0 (0.3)
Apr. 10.6	28.09 (0.58)	70.2 (3.5)	57.69 (1.34)	12.9 (3.1)	34.32 (0.97)	25.0 (2.4)	61.52 (1.15)	45.2 (2.3)	3 54.8 (18.8)	37.7 (0.1)
20.6	28.67 (0.31)	73.7 (3.5)	59.03 (1.04)	16.0 (3.2)	35.29 (0.83)	27.4 (2.7)	62.67 (0.93)	47.5 (2.7)	4 13.6 (18.2)	37.8 (0.7)
30.6	28.98 (0.02)	77.2 (3.4)	60.07 (0.72)	19.2 (3.3)	36.12 (0.68)	30.1 (2.8)	63.60 (0.66)	50.2 (3.0)	4 31.8 (17.1)	38.5 (1.1)
May 10.6	29.00 (0.25)	80.6 (3.2)	60.79 (0.38)	22.5 (3.3)	36.80 (0.52)	32.9 (2.9)	64.26 (0.40)	53.2 (3.2)	4 48.9 (15.7)	39.6 (1.5)
20.5	28.75 (0.52)	83.8 (3.0)	61.17 (0.04)	25.8 (3.2)	37.32 (0.34)	35.8 (3.0)	64.66 (0.12)	56.4 (3.3)	5 04.6 (13.9)	41.1 (1.9)
30.5	28.23 (0.77)	86.8 (2.8)	61.21 (0.30)	29.0 (3.1)	37.66 (0.16)	38.8 (2.9)	64.78 (0.17)	59.7 (3.2)	5 18.5 (11.9)	43.0 (2.3)
June 9.5	27.46 (1.01)	89.6 (2.3)	60.91 (0.63)	32.1 (2.8)	37.82 (0.03)	41.7 (2.9)	64.61 (0.44)	62.9 (3.2)	5 30.4 (9.5)	45.3 (2.6)
19.5	26.45 (1.21)	91.9 (1.9)	60.28 (0.95)	34.9 (2.5)	37.79 (0.20)	44.6 (2.7)	64.17 (0.70)	66.1 (2.9)	5 39.9 (6.9)	47.9 (2.8)
29.4	25.24 (1.39)	93.8 (1.5)	59.33 (1.22)	37.4 (2.2)	37.59 (0.38)	47.3 (2.4)	63.47 (0.95)	69.0 (2.7)	5 46.8 (4.1)	50.7 (2.9)
July 9.4	23.85 (1.52)	95.3 (0.9)	58.11 (1.48)	39.6 (1.7)	37.21 (0.55)	49.7 (2.1)	62.52 (1.16)	71.7 (2.3)	5 50.9 (1.2)	53.6 (3.0)
19.4	22.33 (1.61)	96.2 (0.3)	56.63 (1.68)	41.3 (1.2)	36.66 (0.69)	51.8 (1.8)	61.36 (1.36)	74.0 (2.0)	5 52.1 (1.8)	56.6 (3.0)
29.3	20.72 (1.64)	96.5 (0.1)	54.95 (1.83)	42.5 (0.8)	35.97 (0.81)	53.6 (1.3)	60.00 (1.51)	76.0 (1.5)	5 50.3 (4.7)	59.6 (2.9)
Aug. 8.3	19.08 (1.61)	96.4 (0.8)	53.12 (1.91)	43.3 (0.2)	35.16 (0.92)	54.9 (0.8)	58.49 (1.63)	77.5 (1.1)	5 45.6 (7.6)	62.5 (2.7)
18.3	17.47 (1.53)	95.6 (1.3)	51.21 (1.94)	43.5 (0.5)	34.24 (0.97)	55.7 (0.3)	56.86 (1.73)	78.6 (0.5)	5 38.0 (10.0)	65.2 (2.3)
28.3	15.94 (1.39)	94.3 (1.8)	49.27 (1.87)	43.0 (0.9)	33.27 (1.00)	56.0 (0.2)	55.13 (1.78)	79.1 (0.1)	5 28.0 (12.4)	67.5 (1.9)
Sept. 7.2	14.55 (1.19)	92.5 (2.3)	47.40 (1.76)	42.1 (1.5)	32.27 (0.99)	55.8 (0.8)	53.35 (1.79)	79.2 (0.5)	5 15.6 (14.2)	69.4 (1.5)
17.2	13.36 (0.94)	90.2 (2.6)	45.64 (1.55)	40.6 (2.0)	31.28 (0.93)	55.0 (1.3)	51.56 (1.76)	78.7 (0.9)	5 01.4 (15.4)	70.9 (0.9)
27.2	12.42 (0.64)	87.6 (2.9)	44.09 (1.28)	38.6 (2.5)	30.35 (0.83)	53.7 (1.8)	49.80 (1.68)	77.8 (1.4)	4 46.0 (16.2)	71.8 (0.3)
Oct. 7.2	11.78 (0.30)	84.7 (3.1)	42.81 (0.95)	36.1 (2.7)	29.52 (0.69)	51.9 (2.2)	48.12 (1.57)	76.4 (1.9)	4 29.8 (16.4)	72.1 (0.3)
17.1	11.48 (0.05)	81.6 (3.1)	41.86 (0.58)	33.4 (3.0)	28.83 (0.52)	49.7 (2.6)	46.55 (1.41)	74.5 (2.4)	4 13.4 (15.7)	71.8 (0.9)
27.1	11.53 (0.42)	78.5 (3.1)	41.28 (0.16)	30.4 (3.1)	28.31 (0.33)	47.1 (2.8)	45.14 (1.21)	72.1 (2.7)	3 57.7 (14.6)	70.9 (1.5)
Nov. 6.1	11.95 (0.78)	75.4 (2.8)	41.12 (0.27)	27.3 (3.2)	27.98 (0.10)	44.3 (2.9)	43.93 (0.98)	69.4 (3.1)	3 43.1 (12.8)	69.4 (2.1)
16.0	12.73 (1.12)	72.6 (2.6)	41.39 (0.70)	24.1 (3.0)	27.88 (0.12)	41.4 (3.0)	42.95 (0.72)	66.3 (3.3)	3 30.3 (10.5)	67.3 (2.6)
26.0	13.85 (1.42)	70.0 (2.2)	42.09 (1.11)	21.1 (2.8)	28.00 (0.12)	38.4 (2.9)	42.23 (0.42)	63.0 (3.3)	3 19.8 (7.8)	64.7 (2.9)
Dec. 6.0	15.27 (1.68)	67.8 (1.7)	43.20 (1.48)	18.3 (2.4)	28.35 (0.35)	35.5 (2.7)	41.81 (0.11)	59.5 (3.6)	3 12.0 (4.7)	61.8 (3.2)
16.0	16.95 (1.87)	66.1 (1.1)	44.68 (1.81)	15.9 (2.1)	28.92 (0.78)	32.8 (2.5)	41.70 (0.20)	55.9 (3.5)	3 07.3 (1.6)	58.6 (3.4)
25.9	18.82 (2.03)	65.0 (0.5)	46.49 (2.09)	13.8 (1.5)	29.70 (0.95)	30.3 (2.1)	41.90 (0.51)	52.4 (3.3)	3 05.7 (1.7)	55.2 (3.4)
35.9	20.85	64.5	48.58	12.3	30.65	28.2	42.41	49.0 (3.4)	3 07.4	51.8

(CONSTANTS OF PARIS CONFERENCE.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date	12 Year Cat. 1879.		λ¹ Octantis.		υ Octantis.		β Octantis.		γ¹ Octantis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	h m 20 51	° ′ +80 10	h m 21 35	° ′ −83 09	h m 22 12	° ′ −86 27	h m 22 35	° ′ −81 53	h m 23 46	° ′ −82 33
	s	″	s	″	s	″	s	″	s	″
Jan. 1.2	57.59 (0.67)	85.5 (2.8)	46.35 (0.80)	77.0 (3.0)	43.22 (2.15)	66.5 (2.8)	56.97 (1.02)	53.9 (2.4)	16.56 (1.47)	63.1 (1.6)
11.1	56.92 (0.46)	82.7 (3.1)	45.55 (0.49)	74.0 (3.3)	41.07 (1.63)	63.7 (3.2)	55.95 (0.81)	51.5 (2.9)	15.09 (1.33)	61.5 (2.2)
21.1	56.46 (0.22)	79.6 (3.3)	45.06 (0.19)	70.7 (3.5)	39.44 (1.08)	60.5 (3.5)	55.14 (0.59)	48.6 (3.2)	13.76 (1.14)	59.3 (2.6)
31.1	56.24 (0.03)	76.3 (3.3)	44.87 (0.12)	67.2 (3.6)	38.36 (0.50)	57.0 (3.6)	54.55 (0.36)	45.4 (3.5)	12.62 (0.94)	56.7 (3.1)
Feb. 10.0	56.27 (0.27)	73.0 (3.2)	44.99 (0.42)	63.6 (3.7)	37.86 (0.09)	53.4 (3.8)	54.19 (0.11)	41.9 (3.7)	11.68 (0.71)	53.6 (3.4)
20.0	56.54 (0.51)	69.8 (3.1)	45.41 (0.70)	59.9 (3.6)	37.95 (0.65)	49.6 (3.8)	54.08 (0.13)	38.2 (3.7)	10.97 (0.46)	50.2 (3.6)
Mar. 2.0	57.05 (0.73)	66.7 (2.8)	46.11 (0.97)	56.3 (3.4)	38.60 (1.19)	45.8 (3.7)	54.21 (0.37)	34.5 (3.7)	10.51 (0.21)	46.6 (3.8)
12.0	57.78 (0.91)	63.9 (2.3)	47.08 (1.21)	52.9 (3.2)	39.79 (1.69)	42.1 (3.5)	54.58 (0.60)	30.8 (3.7)	10.30 (0.04)	42.8 (3.8)
21.9	58.69 (1.07)	61.6 (1.8)	48.29 (1.42)	49.7 (3.0)	41.48 (2.16)	38.6 (3.3)	55.18 (0.81)	27.1 (3.4)	10.34 (0.30)	39.0 (3.8)
31.9	59.76 (1.19)	59.8 (1.2)	49.71 (1.61)	46.7 (2.6)	43.64 (2.56)	35.3 (3.0)	55.99 (1.00)	23.7 (3.3)	10.64 (0.54)	35.2 (3.7)
Apr. 10.9	60.95 (1.27)	58.6 (0.6)	51.32 (1.76)	44.1 (2.2)	46.20 (2.92)	32.3 (2.7)	56.99 (1.18)	20.4 (2.9)	11.18 (0.78)	31.5 (3.5)
20.9	62.22 (1.30)	58.0 (0.0)	53.08 (1.87)	41.9 (1.8)	49.12 (3.20)	29.6 (2.2)	58.17 (1.33)	17.5 (2.6)	11.96 (1.00)	28.0 (3.2)
30.8	63.52 (1.29)	58.0 (0.7)	54.95 (1.95)	40.1 (1.3)	52.32 (3.43)	27.4 (1.8)	59.50 (1.45)	14.9 (2.1)	12.96 (1.20)	24.8 (2.9)
May 10.8	64.81 (1.24)	58.7 (1.2)	56.90 (1.98)	38.8 (0.8)	55.75 (3.57)	25.6 (1.3)	60.95 (1.55)	12.8 (1.7)	14.16 (1.37)	21.9 (2.5)
20.8	66.05 (1.15)	59.9 (1.8)	58.88 (1.96)	38.0 (0.3)	59.32 (3.63)	24.3 (0.7)	62.50 (1.60)	11.1 (1.1)	15.53 (1.50)	19.4 (2.1)
30.7	67.20 (1.03)	61.7 (2.3)	60.84 (1.91)	37.7 (0.3)	62.95 (3.61)	23.6 (0.2)	64.10 (1.62)	10.0 (0.7)	17.03 (1.61)	17.3 (1.5)
June 9.7	68.23 (0.88)	64.0 (2.7)	62.75 (1.81)	38.0 (0.7)	66.56 (3.51)	23.4 (0.3)	65.72 (1.60)	9.3 (0.0)	18.64 (1.68)	15.8 (1.1)
19.7	69.11 (0.71)	66.7 (3.0)	64.56 (1.65)	38.7 (1.3)	70.07 (3.30)	23.7 (0.9)	67.32 (1.54)	9.3 (0.4)	20.32 (1.70)	14.7 (0.4)
29.7	69.82 (0.51)	69.7 (3.3)	66.21 (1.46)	40.0 (1.7)	73.37 (3.01)	24.6 (1.4)	68.86 (1.43)	9.7 (1.0)	22.02 (1.67)	14.3 (0.1)
July 9.6	70.33 (0.31)	73.0 (3.5)	67.67 (1.22)	41.7 (2.1)	76.38 (2.63)	26.0 (1.8)	70.29 (1.29)	10.7 (1.5)	23.69 (1.59)	14.4 (0.7)
19.6	70.64 (0.11)	76.5 (3.6)	68.89 (0.94)	43.8 (2.5)	79.01 (2.17)	27.8 (2.3)	71.58 (1.10)	12.2 (1.9)	25.28 (1.48)	15.1 (1.2)
29.6	70.75 (0.11)	80.1 (3.6)	69.83 (0.65)	46.3 (2.7)	81.18 (1.65)	30.1 (2.6)	72.68 (0.89)	14.1 (2.3)	26.76 (1.30)	16.3 (1.7)
Aug. 8.6	70.64 (0.32)	83.7 (3.6)	70.48 (0.31)	49.0 (2.7)	82.83 (1.07)	32.7 (2.8)	73.57 (0.64)	16.4 (2.7)	28.06 (1.09)	18.0 (2.1)
18.5	70.32 (0.51)	87.3 (3.4)	70.79 (0.02)	51.9 (2.9)	83.90 (0.44)	35.5 (3.0)	74.21 (0.36)	19.1 (2.9)	29.15 (0.85)	20.1 (2.6)
28.5	69.81 (0.70)	90.7 (3.3)	70.77 (0.36)	54.8 (2.9)	84.34 (0.21)	38.5 (3.1)	74.57 (0.09)	22.0 (3.0)	30.00 (0.57)	22.7 (2.9)
Sept. 7.5	69.11 (0.86)	94.0 (2.9)	70.41 (0.69)	57.7 (2.8)	84.13 (0.85)	41.6 (3.0)	74.66 (0.20)	25.0 (3.0)	30.57 (0.27)	25.6 (3.0)
17.4	68.25 (1.02)	96.9 (2.7)	69.72 (0.98)	60.5 (2.6)	83.28 (1.47)	44.6 (2.8)	74.46 (0.49)	28.0 (2.9)	30.84 (0.04)	28.6 (3.1)
27.4	67.23 (1.14)	99.6 (2.2)	68.74 (1.25)	63.1 (2.2)	81.81 (2.05)	47.4 (2.5)	73.97 (0.74)	30.9 (2.7)	30.80 (0.36)	31.7 (3.1)
Oct. 7.4	66.09 (1.24)	101.8 (1.7)	67.49 (1.47)	65.3 (1.8)	79.76 (2.55)	49.9 (2.2)	73.23 (0.98)	33.6 (2.4)	30.44 (0.65)	34.8 (3.0)
17.4	64.85 (1.31)	103.5 (1.3)	66.02 (1.63)	67.1 (1.2)	77.21 (2.95)	52.1 (1.7)	72.25 (1.18)	36.0 (2.0)	29.79 (0.93)	37.8 (2.6)
27.3	63.54 (1.34)	104.8 (0.7)	64.39 (1.72)	68.3 (0.6)	74.26 (3.26)	53.8 (1.1)	71.07 (1.32)	38.0 (1.5)	28.86 (1.17)	40.4 (2.3)
Nov. 6.3	62.20 (1.34)	105.5 (0.2)	62.67 (1.75)	68.9 (0.1)	71.00 (3.42)	54.9 (0.5)	69.75 (1.42)	39.5 (0.9)	27.69 (1.36)	42.7 (1.8)
16.3	60.86 (1.31)	105.7 (0.5)	60.92 (1.71)	69.0 (0.6)	67.58 (3.46)	55.4 (0.2)	68.33 (1.47)	40.4 (0.2)	26.33 (1.50)	44.5 (1.3)
26.3	59.55 (1.24)	105.2 (1.0)	59.21 (1.60)	68.4 (1.2)	64.12 (3.38)	55.2 (0.7)	66.86 (1.46)	40.6 (0.3)	24.83 (1.60)	45.8 (0.6)
Dec. 6.2	58.31 (1.12)	104.2 (1.6)	57.61 (1.43)	67.2 (1.8)	60.74 (3.16)	54.5 (1.4)	65.40 (1.39)	40.3 (1.0)	23.23 (1.63)	46.4 (0.0)
16.2	57.19 (0.98)	102.6 (2.1)	56.18 (1.22)	65.4 (2.3)	57.58 (2.85)	53.1 (2.0)	64.01 (1.27)	39.3 (1.6)	21.60 (1.61)	46.4 (0.6)
26.2	56.21 (0.81)	100.5 (2.6)	54.96 (0.97)	63.1 (2.7)	54.73 (2.43)	51.1 (2.5)	62.74 (1.12)	37.7 (2.1)	19.99 (1.53)	45.8 (1.3)
36.1	55.40	97.9	53.99	60.4	52.30	48.6	61.62	35.6	18.46	44.5

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

PART I—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

The greater portion of this Ephemeris, embracing the positions of the Sun and Moon, the distances of the Moon from the center of the Sun, from the centers of the four most conspicuous planets, and from certain fixed stars, together with the .ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder of the work is intended to meet the wants of astronomers. It contains the ephemerides of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the Sun, the Moon's longitude and latitude, data for the libration of the Moon, the obliquity of the ecliptic, the nutation, the positions of certain standard stars, the ephemeris for the meridian of Washington, etc.

TIME.

Astronomers make use of three different kinds of time, namely: First, true or apparent solar time; second, mean solar time; third, sidereal time.

True or Apparent Solar Time.—This species of time is called indiscriminately either true solar time, or apparent solar time, and is measured by the motion of the true Sun; the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being always the hour-angle of the Sun from the meridian. This is the most obvious and natural measure of time, but owing to the obliquity of the ecliptic and the varying motion of the Earth in its orbit, the intervals between successive returns of the Sun to the same meridian are not exactly equal, and consequently ordinary clocks and chronometers can not be regulated to true solar time.

Mean Solar Time.—To avoid the irregularity which would arise from using the true solar day, astronomers have recourse to a mean solar day, whose length is equal to the average of all the true solar days in a year. Just as the true solar day depends upon the motion of the true Sun, so the mean solar day is made to depend upon the motion of an imaginary mean Sun which moves along the equator at a perfectly uniform rate, and whose hour-angle from any given meridian is always the mean solar time thereat. Ordinary clocks and watches, and the chronometers used by navigators, are regulated to this species of time.

Equation of Time.—The imaginary mean Sun is supposed to keep as near the true Sun as is consistent with perfect uniformity of motion, but it is sometimes before and sometimes behind the latter, the greatest difference amounting to rather more than one quarter of an hour. The interval between the true Sun and the imaginary mean Sun is the equation of time, given on pages I and II of the Ephemeris for the meridian of Greenwich, and a knowledge of it is necessary for converting true solar time into mean solar time, or vice versa. As the mean Sun is an imaginary body, mean solar time can not be directly observed, but it can be got either from observations of the true Sun by applying to them the correction for the equation of time, or from observations of the stars by means of the sidereal time of mean noon, given on page II of the Ephemeris for the meridian of Greenwich.

Sidereal Time.—Sidereal time is measured, roughly speaking, by the daily motion of the stars; or in strict accuracy, by the daily motion of that point in the equator from which the true right ascensions of the stars are counted. The point in question is the vernal equinox, and its hour angle is always the sidereal time. Astronomical clocks, regulated to sidereal time, are called sidereal clocks.

Sidereal Day.—A sidereal day is the interval between two successive transits of the vernal equinox over the same meridian. It is $3^m 55.909^s$ of mean solar time shorter than the mean solar day; the tropical year of 365.242 solar days, being divided into 366.242 sidereal days, each comprising 24 sidereal hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 21 of each year the sidereal clock agrees with the mean-time or ordinary clock, and the former gains on the latter $3^m 56.555^s$ of sidereal time per day, so that at the end of a year it will have gained an entire day, and will again agree with the mean-time clock.

Civil Day.—According to the customs of society, the civil day commences at midnight, and comprises twenty-four hours, which extend to the next following midnight. The hours are counted from 0 to 12 in two series; the first, marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

Astronomical Day.—The astronomical day begins at noon on the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and run from the noon of one day to that of the next following. Astronomical time as well as civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day corresponds to the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Thus, January 9, 2 o'clock, A. M., civil time, is January 8, 14^h, astronomical time; and January 9, 2 o'clock, P. M., civil time, is also January 9, 2^h, astronomical time. Hence, we have the following rules:—

To convert Civil Time into Astronomical Time.—If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result will be the corresponding astronomical time; if the civil time is marked P. M., take away the designation P. M., and the astronomical time will result.

To convert Astronomical Time into Civil Time.—If the astronomical time is less than twelve hours, simply write P. M. after it. If greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the days. For example, January 3, 23 hours astronomical time, is January 4, 11 o'clock, A. M., civil time.

To find Greenwich Time.—Express the longitude from Greenwich in time, and when west, add it to the local time, or when east, subtract it from the local time. The result will be the corresponding Greenwich time; mean or sidereal, according as the local time employed is mean or sidereal. For use with this Ephemeris, Greenwich mean time is ordinarily required.

THE CALENDAR.

The Calendar is divided into twelve months, and to each month are assigned eighteen pages, the contents of which are as follows:

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension* and *Declination*, and the *Equation of Time*. Adjoining columns contain the differences of these quantities for one hour. By multiplying any one of these differences by the hours and parts of an hour from Greenwich apparent noon, and adding the amount to,

or subtracting it from, the corresponding quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of the quantity in question for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, and, when great accuracy is required, they should be interpolated for half the hours and parts of an hour of the Greenwich apparent time.

This page is chiefly used when the Sun is observed on the meridian, at which instant the local apparent time is $0^h\ 00^m\ 00^s$. The longitude from Greenwich expressed in time is then the corresponding Greenwich apparent time, before or after noon according as the longitude is east or west. The longitude of any place is therefore the factor employed in reducing the quantities on this page to apparent noon at that place.

The right ascension of the Sun thus reduced is the sidereal time of local apparent noon, and the difference between that and the clock time of the meridian passage of the Sun is the error of the clock on sidereal time.

The declination of the Sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the Sun.

As an example of the use of page I :—

Let the Sun's declination be required at apparent noon, 1902, May 3, at a place whose longitude is $179°\ 40'$, or $11^h\ 58^m\ 40^s$ east from Greenwich :—

			h	m	s
Local apparent time	.	.	. · .	May 3,	00 00 00
Longitude from Greenwich (subtractive) .	.	.			11 58 40
Greenwich apparent time .	.	.	.	May 2,	12 01 20

Reducing the minutes and seconds to decimals of an hour, we find that this moment is 12.022^h after Greenwich apparent noon on May 2, or 11.978^h before Greenwich apparent noon on May 3.

On page 74 of the Ephemeris we find that the change of declination in one hour is:

				"
May 2, at Greenwich apparent noon	.	.	.	+ 45.16
May 3, at Greenwich apparent noon	.	.	.	+ 44.54
Difference for one day	.	.	.	— 0.62

If great exactness is desired, we find the amount of this hourly difference for the time which is half way between Greenwich noon and the time of observation; that is, for 6 hours after Greenwich noon of the 2d, this being half of 12 hours. Six hours is 0.25 of a day; so the calculation is as follows:

					"
Difference for one hour, May 2 .	.	.	.	.	45.16
Change for 0.25 of a day or 0.62″ × 0.25	.	.	.	— 0.16
Difference at 6 hours after noon	.	.	.	.	45.00

$$45.00'' \times 12.022 = 541.0'' = 9'\ 01.0''$$

					o	,	"
Declination at Greenwich noon, May 2	.	.	.	N.	15	10	35.4
Change in 12.022 hours (additive)	.	.	.			09	01.0
Sun's declination at time of observation	.	.	.	N.	15	19	36.4

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is 11.978^h before Greenwich noon of May 3; half this interval is about 0.25 of a day, and the hourly motion for the middle of the interval is $44.70''$. Then, we find:—

					o	,	"
Declination at Greenwich noon, May 3	.	.	.	N.	15	28	31.8
Product of 44.70″ × 11.978 = 535.4″ (subtractive)	.	.				08	55.4
Sun's declination at time of observation	.	.	.	N.	15	19	36.4

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The last column on page III contains the *Mean Time of Sidereal Noon;* that is, the number of hours, minutes, and seconds after Greenwich mean noon when the vernal equinox passes the meridian of Greenwich. It may be reduced to any meridian by interpolating for the longitude, or to any Greenwich sidereal time by means of the hourly difference, -9.8296^s. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time, or from Table 8 of BOWDITCH'S *Navigator*.

This column may be used in converting sidereal time to mean time, instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for May 20, that is, the preceding astronomical day.

	h	m	s
May 21, the mean time of Greenwich sidereal noon is . . .	20	03	56.14
Reduction for longitude from Table II, or $- 9.8296^s \times 6.678$ . .	—	01	05.64
The mean time of local sidereal noon	20	02	50.50
Add the given sidereal time	0	59	49.30 = 0.9970^h
The sum is	21	02	39.80
Reduction for $0^h 59^m 49.30^s$ from Table II, or $- 9.8296^s \times 0.9970$.	—	00	09.80
The required astronomical mean time . . May 21,	21	02	30.00

Page IV contains *The Moon's Semidiameter* and Equatorial *Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the Sun's declination and the equation of time in the preceding examples. The sign plus or minus is prefixed to the hourly differences, according as the horizontal parallax is increasing or decreasing.

The reduction of the Moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.272, or by simply computing the proportional part.

If, for example, the semidiameter of the Moon is to be taken out for 1902, January 18, 10^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of January 18 is 3.1″; then,

$$12^h \ : \ 10^h \ = \ 3.1'' \ : \ 2.6'',$$

which is the correction to be added to the semidiameter at noon, because the semidiameter is increasing. The Moon's semidiameter then, for January 18, 10^h, is 16′ 15.5″.

The Moon's semidiameter and horizontal parallax are required for all observations of the Moon. When great precision is needed, the hourly differences should be interpolated for half the interval of Greenwich time from noon or midnight, and the horizontal parallax should be corrected for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich* and the *Age of the Moon* are also contained on page IV. The time of transit is given to tenths of a minute, and is accompanied by a column of differences for one hour of longitude, by means of which the local time of the Moon's meridian transit may be computed for any other place whose longitude is known. Table 11 of BOWDITCH'S *Navigator* furnishes the necessary reduction by simple inspection. The age of the Moon, or the time elapsed since the preceding new Moon, is given to tenths of a day.

Pages V–XII contain *The Moon's Right Ascension* and *Declination* for each day and hour of Greenwich mean time. They are accompanied by columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may either be taken from a well-regulated chronometer, or may be obtained by applying the longitude converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the day and hour of the Greenwich mean time; the *Diff. for 1 Minute* is multiplied by the minutes and parts

of a minute of the Greenwich time, and the product is added to or subtracted from the quantity, according as the latter is increasing or decreasing.

Thus, suppose the Moon's right ascension and declination are required for 1902, August 20, 10^h 10^m 30^s, astronomical mean time at Greenwich:—

	Right Ascension.		Declination.
	h m s		o ′ ″
August 20, 10^h . . .	23 06 27.74		S. 2 11 03.6
Diff. 2.0681^s × 10.5 . .	+ 21.72	+ 10.634″ × 10.5	+ 01 51.7
August 20, 10^h 10^m 30^s . .	23 06 49.46		S. 2 09 11.9

For the sake of precision, the differences here employed have been interpolated for $5.2^m = 0.09^h$.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the Earth.

Pages XIII–XVIII contain the *Lunar Distances*, or the angular distances of the center of the Moon from the center of the Sun, from the centers of the four brighter planets, and from certain fixed stars, as they would appear to an observer at the center of the Earth. They are given for every third hour of Greenwich mean time, and as the reckoning begins at noon, the dates are astronomical. All the distances which can be observed on the same day are grouped together under that date, and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the Sun, planet, or star, to indicate whether it is on the west or east side of the Moon.

An observer on the Earth's surface by measuring a lunar distance, correcting it for errors of his instrument and for the semidiameters of the objects, and clearing it from the effects of refraction and parallax, finds the true or geocentric distance; that is, the distance as it would have appeared from the center of the Earth at the moment of observation. By comparing this distance with the corresponding distances given in the Ephemeris, the Greenwich mean time of the observation can be derived.

To lessen the labor of computation, the Ephemeris contains, between every two successive distances, the logarithm of the seconds of time in which the distance changes one second of arc; or, as it is usually called, the *Proportional Logarithm of the Difference.* It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time corresponding to a given lunar distance we have the following rule :—

Find in the Almanac the two distances between which the true distance falls; take out the nearer of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.

Find the difference between the true distance and the distance taken from the Almanac; and from the proportional logarithm of this difference, as found in Table 45 of BOWDITCH'S *Navigator, subtract the P. L. of Diff. taken from the Almanac.*

The result will be the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Almanac, when the earlier Almanac-distance is used; or to be subtracted from the hours of Greenwich time, when the later Almanac-distance is used.

Another method is, to add the common logarithm of the difference in seconds between the true and the Almanac-distances to the P. L. of Diff. of the Almanac; the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. Table 34 of BOWDITCH'S *Navigator* saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies continually, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which follows it in the Ephemeris (or, more strictly, half the difference of the preceding and fol-

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lowing ones).   With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the Ephemeris are decreasing; or subtracted when they are increasing.

Thus the Greenwich mean time of an observation can be ascertained, and if the observer has noted the time of observation by a chronometer, the difference between this chronometer-time and the Greenwich ·mean time will be the error of the chronometer on Greenwich time as found from the lunar distance.   In that way lunar distances can be used as a check upon the chronometer, and by a series of them carefully observed on both sides of the Moon, the chronometer-error may generally be determined within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude.   A longitude derived by this method should always be considered as uncertain by 5′ or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1902, February 5, the corrected distance of the Moon's center from that of Spica is 80° 52′:—

		o	,	″		
Corrected distance	. . . . .	80	52	00		
Distance in Ephemeris Feb. 5, VIʰ	. . .	80	41	37	P. L.	0.2871
Difference	. . . . .	0	10	23	P. L.	1.2389
		h	m	s	P. L.	0.9518
Time from VIʰ (*after*) .	. . . .	0	20	07		
Corr. for 2d Diff., Table I	. . .	+	02			
Greenwich mean time Feb. 5 .	. . .	6	20	09		

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:—

From Ephemeris	. . . . . .	.	P. L.	0.2871
Diff. of distances, 10′ 23″ = 623″	. . . .	.	log	2.7945
Red. of Greenwich time, 1207ˢ = 0ʰ 20ᵐ 07ˢ .	. .	.	log	3.0816

The result is the same as by the previous method.

Pages 218–249 contain the geocentric ephemerides of the seven major planets.   The places given are apparent positions; that is, they are referred to the equator and true equinox of the date, and are corrected for aberration.   All the data except meridian passage are given for the instant of Greenwich mean noon.   The column *Meridian Passage* shows the hour, minute, and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it is observed for time, latitude, or azimuth.   The mode of reducing the ephemeris positions of planets to other instants of Greenwich mean time is the same as that given for the Sun on pages 551–553.   The local mean time of meridian passage of any planet, at any place, can be found by dividing the proper daily difference of the ephemeris times by 24, multiplying the quotient by the longitude of the place expressed in hours and fractions, and applying the product with its proper sign to the time of Greenwich passage.

Pages 250–271 contain the heliocentric co-ordinates of the seven major planets, and the logarithms of their distances from the Earth.   The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date.   It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required.   The daily motion is given for the instant of Greenwich mean noon.   The

column *Reduction to Orbit* contains the correction to be applied to the heliocentric longitudes in order to obtain the longitude counted along the orbit of the planet. This longitude is equal to the distance from the mean equinox to the node, plus the distance from the node to the planet. The heliocentric latitude is counted from the true ecliptic of the date. The *Logarithm of Radius Vector* is the logarithm of the distance of the center of the planet from that of the Sun, at the Greenwich mean noon whose date is given in the first column. The last two columns give, respectively, the logarithm of the true distance of the center of the planet from that of the Earth, for the Greenwich noon indicated on the left-hand side of the page, and for the time which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean midnight of the same day; in the case of Venus and Mars, it is the mean noon of the day immediately following; in the case of Jupiter and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 272–279 contain the rectangular co-ordinates of the center of the Sun, referred to the center of the Earth as the origin, and to the true equator and equinox of each date as the plane and point of reference. Each co-ordinate is given both for Greenwich mean noon, and for Greenwich mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan.* o.o give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of January o.o of the Besselian fictitious year.

Pages 280–283 give for every Greenwich mean noon and midnight the apparent geocentric longitude and latitude of the Moon referred to the true ecliptic and equinox of the date.

Page 284 contains the position of the Moon's equator, the longitude of the Moon's perigee, the mean longitude of the Moon's ascending node, and the Moon's mean longitude.

Page 285 contains the elements of the libration of the Moon, and the Sun's aberration and horizontal parallax. The epochs of greatest libration of the Moon, together with the formulæ for finding the libration in longitude and latitude are given on page 439. *The Sun's Aberration* is the quantity which is to be applied to the true longitude of the Sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The *Sun's Equatorial Horizontal Parallax*, given in the last column, is the angle subtended by the equatorial radius of the Earth, as seen from the center of the Sun.

Pages 286–288 give data for precession and the obliquity of the ecliptic, together with all sensible terms arising from the motions of the equator and ecliptic. To show clearly the relations of these quantities, let

λ = the longitude of any body referred to the true equinox of the date.

λ' = the longitude of the same body referred to the mean equinox of the beginning of the Besselian fictitious year.

ψ_1 = the adopted value of the general precession.

$\delta'\psi$ = the principal term of the nutation in longitude; or, in other words, the correction to be applied to the longitude of a body referred to the mean equinox of date, in order to obtain that longitude as referred to the true equinox, exclusive of short period terms. When the correction is positive, the true longitudes are greater than those referred to the mean equinox; while the contrary is the case when the correction has a negative sign.

$\delta''\psi$ = the short period terms of nutation in longitude, given on pages 287–288.

ω = the true or apparent obliquity of the ecliptic at the date.

ω' = the mean obliquity of the ecliptic at the beginning of the Besselian fictitious year.

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$\delta'\omega$ = the principal term of the nutation of the obliquity of the ecliptic; or, in other words, the correction to be applied to the mean obliquity of date in order to find the true or apparent obliquity, exclusive of short period terms. This quantity is tabulated on page 286, and is positive or negative according as the true obliquity is greater or less than the mean obliquity.

$\delta''\omega$ = the short period terms of nutation in obliquity, given on pages 287–288.

τ = the fraction of a year intervening between the instant when the Sun's mean longitude was 280° and the date for which λ or ω is required.

Then

$$\lambda = \lambda' + \tau \psi_1 + \delta'\psi + \delta''\psi$$
$$\omega = \omega' - 0.464'' \tau + \delta'\omega + \delta''\omega$$

Page 286 contains, for each fifth Greenwich mean noon throughout the year, certain quantities which may be described in terms of the above notation as follows: The *Precession in Longitude from 1902.0* = $\tau \psi_1$; the *Nutation in Longitude* = $\delta'\psi$; the *Nutation in Right Ascension* = $(\delta'\psi) \cos \omega'$; the *Nutation in Obliquity* = $\delta'\omega$, and the *Obliquity of the Ecliptic* = $\omega - \delta''\omega$, which is the true inclination of the Earth's equator to the ecliptic, exclusive of the terms depending on the Moon's longitude.

Pages 287–288 contain the values of $\delta''\psi$ and $\delta''\omega$, which are not included in the values of nutation given on page 286.

PART II—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 290 contains formulæ for reducing the positions of fixed stars, including expressions for the Besselian star-numbers and star-constants, and for the independent star-numbers; the whole based upon the constants of STRUVE and PETERS, and expressed in the notation of BESSEL.

Pages 291–294 contain the logarithms of the *Besselian Star-Numbers, A, B, C, D,* for each Washington mean midnight. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given, and in ordinary cases four figure logarithms suffice; but where extreme accuracy is desired the logarithms of *A, C,* and *D* are sometimes needed to five places of decimals. If used in accordance with the English and French notation, the pair of quantities *A* and *B* must be interchanged with the pair *C* and *D;* that is, *A* must be interchanged with *C,* and *B* with *D.* In the first column, along with the solar day, the sidereal hour of Washington mean midnight is given for certain dates. The sidereal time for which any set of quantities is given can be found by interpolation from these numbers.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:—

Computation of the apparent place of π Aquarii for 1902, August 17, for the upper transit at Washington.

	log a	0.4863	log b	6.9678	log c	8.7815	log d	8.4488 n
(Page 293)	log A	9.9126	log B	0.9021	log C	1.1829	log D	1.0763 n
	log a'	1.2597	log b'	9.6248	log c'	9.6437	log d'	8.1438
	log $A a$	0.3989	log $B b$	7.8699	log $C c$	9.9644	log $D d$	9.5251
	log $A a'$	1.1723	log $B b'$	0.5269	log $C c'$	0.8266	log $D d'$	9.2201 n

		h	m	s			°	′	″
Mean Place, 1902.0,	$a_0 =$	22	20	16.332		δ_0	= + 0	52	47.84
	$A a =$			+ 02.506		$A a'$	=		+ 14.87
	$B b =$			+ 00.007		$B b'$	=		+ 03.36
	$C c =$			+ 00.921		$C c'$	=		+ 06.71
	$D d =$			+ 00.335		$D d'$	=		− 00.17
	$E =$			+ 00.002		$\tau \mu'$	=		00.00
	$\tau \mu =$			00.000					
Apparent Place, August 17,	$a =$	22	20	20.103		δ	= + 0	53	12.61

Pages 295–302 contain the *Independent Star-Numbers*, which can frequently be advantageously used instead of the *Besselian Star-Numbers.* These quantities are connected

with those of BESSEL by the relations given on page 290, which also contains the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, a, b, c, $\overset{\bullet}{d}$, a', b', c', d', while the independent star-numbers render it possible to determine the apparent place of a star without computing these star-constants. Four figure logarithms usually suffice, but where extreme accuracy is desired the logarithms of g and h are needed to five places of decimals, and G and H are needed to one-tenth of a minute of arc. The column τ gives the fraction of a year, counted from the beginning of the Besselian fictitious year to each date.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:—

Computation of the apparent place of π Aquarii for 1902, August 17, for the upper transit at Washington.

$a_0 = 335\ 04$		$\delta_0 = +\ \ 0\ 53$
$G = 25\ 57$		$G + a_0 = \ \ 1\ 01$
$H = 128\ 02$		$H + a_0 = 103\ 06$

$\log \tfrac{1}{15}$	8.8239	$\log \tfrac{1}{15}$	8.8239	$a_0 =$	22 20 16.332
$\log g$	1.2609	$\log h$	1.2866	$f =$	+ 02.514
$\log \sin(G + a_0)$	8.2490	$\log \sin(H + a_0)$	9.9885	$(g) =$	00.000
$\log \tan \delta_0$	8.1864	$\log \sec \delta_0$	0.0001	$(h) =$	+ 01.256
$\log (g)$	6.5202	$\log (h)$	0.0991	$\tau \mu =$	00.000
				Apparent R. A., $a =$	22 20 20.102

$\log g$	1.2609	$\log h$	1.2866	$\delta_0 =$	+ 0 52 47.84
$\log \cos(G + a_0)$	9.9999	$\log \cos(H + a_0)$	9.3554 n	$(g') =$	+ 18.23
$\log (g')$	1.2608	$\log \sin \delta_0$	8.1863	$(h') =$	− 00.07
		$\log (h')$	8.8283 n	$(i) =$	+ 06.61
				$\tau \mu' =$	00.00
				Apparent Dec. $\delta =$	+ 0 53 12.61

$\log i$	0.8202
$\log \cos \delta_0$	9.9999
$\log (i)$	0.8201

Page 303 contains for every tenth sidereal day the *Besselian* and *Independent Star-Numbers*, exclusive of all short period terms. They are useful in computing ephemerides of stars, similar to those on pages 324–399, for which constants containing short period terms should not be employed.

Pages 304–311 contain the mean places of three hundred and eighty-three stars, for the beginning of the Besselian fictitious year 1902, or, in other words, for the moment when the Sun's mean longitude is 280°.

The annual variations are to be considered as the differential coefficients of each co-ordinate with respect to the time at the beginning of the year.

Pages 312–323 contain the apparent positions of the four northern circumpolar stars, a, δ and λ Ursæ Minoris, and 51 Cephei, for every upper transit at Washington. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26 is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 312, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But, the lower transit following that of July 1 (page 318), does not take place until July 2.3. Hence, the lower transit of July 1 precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column of *Mean Solar Date*.

Pages 324–399 contain, for every tenth upper transit at Washington, the apparent places of 379 stars, being all those given in the list of mean places, except the four northern circumpolars. The mean solar date in the left hand column of each page gives the day and

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tenth of the transit, so that intermediate transits may be readily identified; and to facilitate interpolation, the differences of each co-ordinate are given for every ten days.

Pages 400–407 contain the apparent right ascension, declination, and semidiameter of the Sun, for Washington mean noon, together with the sidereal time for that instant. Adjoining columns give the seconds of right ascension and declination for apparent noon; that is, for the moment of transit of the Sun's center over the meridian of Washington. The hours and minutes of right ascension and the degrees and minutes of declination are always made the same for both mean and apparent noon. In cases where they really differ, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that the sum of the two remains correct. The hourly motions in right ascension and declination are given for the moment of mean noon, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the Sun's center over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich*.

Pages 408–415 contain the right ascension, declination, semidiameter, and parallax of the Moon, at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the Moon's center over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington would exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the instant of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the Moon in right ascension were uniform, or, in other words, they are differential coefficients corresponding to the instants of Washington transit. By means of them, when second differences are taken into account, the position of the Moon can be computed with great exactness for the moment of transit over any meridian not more than one hour distant from Washington. To obtain the same accuracy for more distant meridians, we may proceed as follows: Let F represent either the *Mean Time of Transit*, the *Right Ascension of Center*, or the *Geocentric Declination of Center*, and let D represent the corresponding *Difference for One Hour of Longitude*. Write down three successive values of F, together with the corresponding values of D, and difference the latter as in the following scheme; where the middle values, F_0 and D_0, belong to the Washington culmination from which is to be derived the value of F for the culmination on the meridian whose longitude is λ.

Function.	Diff. for 1 Hour of Longitude.	Δ'	Δ''
F_{-1}	D_{-1}		
F_0	D_0	a'	
F_{+1}	D_{+1}	a''	b

Then, for the culmination at the meridian λ

$$F_\lambda = F_0 + \lambda D_0 + \frac{\lambda^2}{96}(a' + a'') + \frac{\lambda^3 b}{3456}$$

where λ must be expressed in hours and decimals of an hour, and is to be taken + or — according as the longitude from Washington is west or east.

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The columns of *Sidereal Time of Semidiameter passing Meridian*, etc., do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When one limb is full and the terminator is within 0.05″ of the opposite limb, both can be well observed, and in such cases both are indicated.

Pages 416–432 contain the geocentric apparent right ascensions and declinations of the seven major planets, together with their semidiameters, horizontal parallaxes, and sidereal times of semidiameters passing the meridian, for the moments of all transits which can be observed over the meridian of Washington.

PART III—PHENOMENA.

This part gives the dates of the principal astronomical phenomena of the year, expressed in Washington mean time, except in the case of the eclipses and the data for the rings of Saturn, which are expressed in Greenwich mean time.

Pages 434–438 contain all necessary data respecting the solar and lunar eclipses which occur during the year.

The eclipse-elements are given for the moment of conjunction of the Sun and Moon in right ascension, but the subsequent tables and results are computed from the exact positions of these bodies at the several instants referred to. The times and angles designated as the circumstances of a lunar eclipse remain the same throughout all parts of the earth, and require no explanation beyond a mere statement of the fact that in computing them the geometrical diameter of the Earth's shadow has been augmented in the proportion of 51:50. The principal circumstances of each solar eclipse are stated as follows:—

On the line "Eclipse begins" is given the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

On the line "Central eclipse begins" is given the time when the axis of the Moon's shadow first touches the Earth, and the latitude and longitude of the point of contact follow.

On the line "Central eclipse at noon" is given the time when the axes of the Earth and of the shadow cone lie in the same plane. The latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface follow, and there the eclipse will be central and the Sun will be exactly on the meridian.

The phrases "Central eclipse ends" and "Eclipse ends" are followed by a statement of the times when, and the localities where these events occur; the phenomena being the converse of those denoted by the similar phrases for the beginning.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outlines of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for the changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of 1902, May 7, begins and ends at the place whose latitude is 40° S., and whose longitude is 150° W.

For the beginning we compare the distance of the place from the curves of 9^h and 10^h and find it to correspond to about 25 minutes from the former, thus giving for the

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... that intermediate transits may be readily identified; and ... the differences of each co-ordinate are given for every ten days

... contain the apparent right ascension, declination, and semidi... for Washington mean noon, together with the sidereal time for th... columns give the seconds of right ascension and declination for appar... by the moment of transit of the Sun's center over the meridian of Washingt... and minutes of right ascension and the degrees and minutes of declination a... the same for both mean and apparent noon. In cases where they re... which would have been numerically larger is diminished by one, and th... by sixty, so that the sum of the two remains correct. The hourly mo... and declination are given for the moment of mean noon, but may b... the same values for apparent noon

The *Reduction of Mean to Apparent Noon* is the correction to be applied ... mean time. It is, therefore, mean time minus apparent t... taken to the mean time of transit of the Sun's center over the meridia... counted from the nearest noon. The use of all the quantities is substa... on the *Reduction to the Meridian of Greenwich*

... contain the right ascension, declination, semidiameter, and ... the Moon at the moment of transit over the meridian of Washington. The... in the second column is that of transit of the Moon's center over this mer... for one hour of longitude are the amounts by which the local m... ascension one hour west of Washington would exceed those ... supposing the rate of change to be uniform ... at the moment of transit over the meridian of Washington ...

The columns of *Stars* ...
y explanation, except ...
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Pages 416–432 contain ...
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51:50. The ...

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.285	7
.00278	9
.00269	11
.00258	11
.00247	13
0.00234	13
0.00221	13
0.00209	12
0.00196	13
0.00184	12
0.00174	10
0.00165	9
0.00157	8
0.00152	5
0.00149	3
0.00147	2

.ation, take from the table of elements
.he longitude west from Greenwich, the

$$\cos (\mu - \lambda) = \eta_1 - \eta_2$$
$$\cos (\mu - \lambda) = \zeta_1 + \zeta_2$$
.ill be—

$$\lambda)$$
$$.a (\mu - \lambda) = [7.63992] \, \xi \sin d$$

.wich mean time, take from the tables of
.of the shadow together with their varia-
.ith of the differences of two consecutive
.v' and y', and their logarithms are given at

.' of the axis of the shadow relative to the
.are computed by the formulæ—
$$= x - \xi$$
$$= y - \eta$$
$$= x' - \xi'$$
$$= y' - \eta'$$
.umbra, the radius L at the distance ζ from the
.ula
$$- \zeta \tan f$$
ts, and ζ computed in (1).

approximate time of beginning $9^h 25^m$; for the end we compare the distance of the place from the curves of 11^h and 12^h and find it to be about 40 minutes from the former, thus giving for the approximate time of ending $11^h 40^m$, and both of these results are probably correct to within 3 or 4 minutes. Changing to local mean time we shall have—

		Beginning.			Ending.		
		d	h	m	d	h	m
Greenwich mean time	May	7	09	25	7	11	40
Longitude west			10	00		10	00
Local mean time	May	6	23	25	7	01	40

In the case of total and annular eclipses, a rough estimate of the magnitude of the eclipse may be obtained from the position of the place relatively to the central line and to the limit. On the central line, the eclipse is annular or total, while on the limit, the limb of the Moon only grazes that of the Sun.

More Accurate Computations.—A more accurate determination of the phases, as visible at any point of the Earth's surface, may be obtained from the Besselian elements which are given for every ten minutes of Greenwich mean time. Their geometric signification is as follows:

Let us imagine a plane passing through the center of the Earth, perpendicular to the right line joining the centers of the Sun and Moon. This latter line is the axis of the Moon's shadow, and the plane is called the *fundamental plane* or plane of xy. We take the intersection of this plane with that of the Earth's equator as the axis of x, and the center of the Earth as the origin of co-ordinates. The axis of y is perpendicular to that of x, and directed toward the north; x and y are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane, and they are here expressed in terms of the Earth's equatorial radius as unity. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; or, in other words, it is the declination of the center of the Sun as seen from the center of the Moon. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l_1 and l_2 are the radii of the shadow-cones upon the fundamental plane, l_1 corresponding to the penumbra, and l_2 to the umbra, or annulus. The notation is that of CHAUVENET's *Spherical and Practical Astronomy*, in which l_2 is regarded as positive for an annular, and negative for a total eclipse.

The angles f_1 and f_2, the tangents of which are given, are the angles which the elements of the respective shadow-cones make with the axis of the shadow; or, they are the semi-angles of the two cones.

In order to facilitate interpolation to any required moment, the logarithms of x', y' and μ', which are the changes of x, y, and μ, in one minute of time, are given at the bottom of the table.

The method of computing an eclipse from its Besselian elements is based on the fact that at the moments of beginning and ending the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find this distance and radius we proceed as follows:—

(1) The co-ordinates of the observer, ξ, η, and ζ, together with their variations in one minute, are computed for some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase.

(2) The co-ordinates x and y of the axis of the shadow, together with their variations in one minute, are taken for the same moment from the tables of elements.

(3) From (1) and (2) the position and motion of the observer relative to the axis of the shadow is found.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follows:—

(1) Find $\rho \cos \varphi'$ and $\rho \sin \varphi'$, which are the geocentric co-ordinates of the station referred to the Earth's equator, ρ being the distance from the center of the Earth, and φ' the geocentric latitude. These co-ordinates may be obtained from geodetic tables, or may be computed from the following table based on CLARKE's spheroid of 1866, by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$
$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Co-ordinates of a Place.

φ	Log F.		Log G.	
0°	0.00000		0.00295	
.5	0.00001	1	0.00294	1
10	0.00004	3	0.00291	3
15	0.00010	6	0.00285	6
20	0.00017	7	0.00278	7
25	0.00026	9	0.00269	9
30	0.00037	11	0.00258	11
35	0.00048	11	0.00247	11
40	0.00061	13	0.00234	13
45	0.00074	13	0.00221	13
50	0.00086	12	0.00209	12
55	0.00099	13	0.00196	13
60	0.00111	12	0.00184	12
65	0.00121	10	0.00174	10
70	0.00130	9	0.00165	9
75	0.00138	8	0.00157	8
80	0.00143	5	0.00152	5
85	0.00146	3	0.00149	3
90	0.00147	1	0.00147	2

For the assumed Greenwich mean time of computation, take from the table of elements the values of $\sin d$, $\cos d$, and μ. Then with λ for the longitude west from Greenwich, the co-ordinates of the observer will be—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$
$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) = \eta_1 - \eta_2$$
$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) = \zeta_1 + \zeta_2$$

and their variations in one minute of mean time will be—

$$\xi' = [7.63992] \, \rho \cos \varphi' \cos (\mu - \lambda)$$
$$\eta' = [7.63992] \, \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992] \, \xi \sin d$$
$$\zeta' \text{ is not needed.}$$

(2) For the same assumed moment of Greenwich mean time, take from the tables of elements the co-ordinates x and y of the axis of the shadow together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. These variations are represented by x' and y', and their logarithms are given at the foot of the tables.

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N, are computed by the formulæ—

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$
$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$

(4) Both for the shadow, and for the penumbra, the radius L at the distance ζ from the fundamental plane is computed by the formula

$$L = l - \zeta \tan f$$

l and f being found in the table of elements, and ζ computed in (1).

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(5) If the time chosen for computation is exactly that of the beginning or ending of the eclipse, we shall have

$$m = L$$

But, as this condition will rarely be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values to this angle, of which one will be in the first and the other in the second quadrant when $\sin \psi$ is positive, and one in the third and the other in the fourth quadrant when $\sin \psi$ is negative; but simplicity will be gained by taking only that value of ψ for which $\cos \psi$ is positive. This value lies between the limits $+ 90°$ and $- 90°$. The correction τ to the assumed time of beginning or ending of the eclipse will then be found in minutes, from—

$$\tau = - \frac{m \cos (M - N)}{n} \mp \frac{L \cos \psi}{n}$$

where the double sign is to be taken negative for the beginning and positive for the ending. One such pair of values of τ cannot, however, give the times of both beginning and ending with accuracy. To attain that, we must commence the computation by assuming two times, one near the beginning, and the other near the ending of the eclipse; both of which may be derived from the chart with sufficient exactness. The computation for the first assumed time will give a small value of τ which, when applied to the assumed time, will give the beginning of the eclipse nearly correctly, and a large value which will give an inaccurate time of ending. Similarly the computation for the second assumed time will give a small and nearly correct value of τ, for finding the time of ending, and a large and inaccurate negative value for finding the time of beginning. We shall thus deduce two times of each phase, only one of which is to be regarded as approximately correct.

The more accurate times of beginning and ending may now be taken in place of those originally assumed, and the whole computation may be repeated, thus leading to a pair of values of τ, which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors, but a second approximation may be obtained without it, by finding a corrected value of τ in accordance with the formulae—

$$\delta\tau = \mp \frac{\tau (l' + [5.3100] \xi \cos d)}{n \cos \psi} - \frac{[4.9788] \tau^2}{n \cos \psi} [\xi \sin (N \mp \psi) - \eta_2 \cos (N \mp \psi)]$$

$$\tau_0 = \tau + \delta\tau$$

where the double signs are to be taken negative for the beginning of the eclipse and positive for the ending. l' is the variation of l for one minute of time, and its numerical value can be taken by inspection from the table of Besselian elements.

If the resulting values of τ_0 are not greater than fifteen minutes, the corrected times of contact thus obtained will be theoretically exact within less than a second, but the uncertainties of the solar and lunar tables are such that an unavoidable error of several seconds may exist in the prediction. To guard against numerical mistakes it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, the computer must use his own judgment as to making further corrections and computations.

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Position-angle of Point of Contact.—The position-angle P, of the point of contact, reckoned from the north point of the Sun's limb toward the east, is found by the formula

$$P = N - \psi \pm 180° \text{ for the beginning,}$$
$$P = N + \psi \qquad \text{for the ending,}$$

it being assumed that, in each case, the value of ψ is taken between the limits $\pm 90°$.

Computation of the Solar Eclipse of 1902, October 30, for Urga.

The position of Urga is—

Latitude, $\varphi = + 48° \; 20' \; 12''$
Longitude, $\lambda = -107° \; 30' \; 00''$

and its geocentric co-ordinates are—

$$\rho \sin \varphi' = 9.87123$$
$$\rho \cos \varphi' = 9.82348$$

From the Eclipse Charts and the table on page 438 we find the approximate times of the phases to be—

	d	h	m	
Beginning October	30	19	25	} Greenwich Mean Time.
Ending	30	21	50	}

Greenwich Mean Time, October 30	Beginning. $19^h 25^m$	Ending. $21^h 50^m$
	$\circ \quad ' \quad ''$	$\circ \quad ' \quad ''$
μ	295 18 48	331 34 00
λ	—107 30 00	—107 30 00
$\mu - \lambda$	42 48 48	79 04 00
$\rho \cos \varphi'$	9.82348	9.82348
$\sin (\mu - \lambda)$	9.83226	9.99204
$\log \xi$	9.65574	9.81552
ξ	+ 0.45263	+ 0.65391
$\rho \sin \varphi'$	9.87123	9.87123
$\cos d$	9.98720	9.98715
	9.85843	9.85838
η_1	+ 0.72182	+ 0.72173
$\rho \cos \varphi'$	9.82348	9.82348
$\sin d$	9.37880 n	9.37979 n
$\cos (\mu - \lambda)$	9.86544	9.27799
	9.06772 n	8.48126 n
η_2	— 0.11688	— 0.03029
$\eta = \eta_1 - \eta_2$	+ 0.83870	+ 0.75202
$\rho \sin \varphi' \sin d$	9.25003 n	9.25102 n
ζ_1	— 0.17784	— 0.17825
$\rho \cos \varphi' \cos d \cos (\mu - \lambda)$	9.67612	9.08862
ζ_2	+ 0.47438	+ 0.12264
$\zeta = \zeta_1 + \zeta_2$	+ 0.29654	— 0.05561
const. log	7.63992	7.63992
$\rho \cos \varphi' \cos (\mu - \lambda)$	9.68892	9.10147
$\log \xi'$	7.32884	6.74139
ξ'	+ 0.002132	+ 0.000551
const. log	7.63992	7.63992
$\xi \sin d$	9.03454 n	9.19531 n
$\log \eta'$	6.67446 n	6.83523 n

		Beginning.	Ending.
Greenwich Mean Time,	October 30	$19^h\ 25^m$	$21^h\ 50^m$
	η'	$-\ 0.000473$	$-\ 0.000684$
	$x - \xi$	$-\ 0.48059$	$+\ 0.53657$
	$y - \eta$	$+\ 0.35618$	$+\ 0.15145$
	$x' - \xi'$	$+\ 0.006273$	$+\ 0.007852$
	$y' - \eta'$	$-\ 0.001538$	$-\ 0.001324$
	$m \sin M$	$9.68177\,n$	9.72963
	$m \cos M$	9.55167	9.18027
	$\tan M$	$0.13010\,n$	0.54936
	M	$306°\ 32'\ 37''$	$74°\ 14'\ 17''$
	$\sin M$	$9.90493\,n$	9.98335
	$\log m$	9.77684	9.74628
	$n \sin N$	7.79748	7.89498
	$n \cos N$	$7.18696\,n$	$7.12189\,n$
	$\tan N$	$0.61052\,n$	$0.77309\,n$
	N	$103°\ 46'\ 33''$	$99°\ 34'\ 16''$
	$\sin N$	9.98732	9.99391
	$\log n$	7.81016	7.90107
	$\tan f$	7.67316	7.67317
	$\log \zeta$	9.47208	$8.74515\,n$
		7.14524	$6.41832\,n$
	$\zeta \tan f$	$+\ 0.00140$	$-\ 0.00026$
	l	$+\ 0.56510$	$+\ 0.56531$
	L	$+\ 0.56370$	$+\ 0.56557$
	$M - N$	$202°\ 46'\ 04''$	$334°\ 40'\ 01''$
	$\sin (M - N)$	$9.58771\,n$	$9.63133\,n$
	$\log m$	9.77684	9.74628
	$\text{colog } L$	0.24895	0.24751
	$\sin \psi$	$9.61350\,n$	$9.62512\,n$
	ψ	$-\ 24°\ 14'\ 51''$	$-\ 24°\ 56'\ 58''$
	$\log \dfrac{m}{n}$	1.96668	1.84521
	$\cos (M - N)$	$9.96477\,n$	9.95609
		$1.93145\,n$	1.80130
	$-\dfrac{m}{n} \cos (M - N)$	$+\ 85.398$	$-\ 63.284$
	$\log L$	9.75105	9.75249
	$\cos \psi$	9.95989	9.95745
	$\text{colog } n$	2.18984	2.09893
		1.90078	1.80887
	$\dfrac{L \cos \psi}{n}$	$\mp\ 79.576$	$\pm\ 64.397$
	τ	$+\ 5.822^m$	$+\ 1.113^m$
	T	$19^h\ 25^m$	$21^h\ 50^m$
	t	$19\ 30.822$	$21\ 51.113$

Since the value of τ for the beginning is rather large, we compute the correction $\delta\tau$ for this phase as follows:—

	Beginning.			Beginning.
const. log	5.3100		$\cos (N - \psi)$	9.7895 n
log ξ	9.6557		log η_2	9.0677 n
cos d	9.9872		$\log \eta_2 \cos (N - \psi)$	8.8572
	4.9529		$\xi \sin (N - \psi)$	+ 0.3566
number	+ 0.0000090		$\eta_2 \cos (N - \psi)$	+ 0.0720
l' (from p. 438)	+ 0.0000020		diff.	+ 0.2846
sum	+ 0.0000110		log (diff.)	9.4542
log (sum)	5.0414		const log	4.9788
log τ	0.7650		log τ^2	1.5300
colog n	2.1898		colog (n cos ψ)	2.2299
sec ψ	0.0401			8.1929
	8.0363		(2)	− 0.0156
(1)	− 0.0109			m
$N - \psi$	128°01′		(1) + (2) $= \delta\tau$	− 0.0265
sin ($N - \psi$)	9.8964		τ	+ 5.822
log ξ	9.6557		τ_0	+ 5.796
log ξ sin ($N - \psi$)	9.5521			

The corrected time of beginning is, therefore,

$$t_0 = \text{October } 30^{\mathrm{d}} \ 19^{\mathrm{h}} \ 30.796^{\mathrm{m}}$$

A repetition of the principal computation, for the assumed time $T = 19^{\mathrm{h}} \ 30^{\mathrm{m}}$, gives exactly this result. Whence we find—

	Beginning.	Ending.
Greenwich Mean Time, October	$30^{\mathrm{d}} \ 19^{\mathrm{h}} \ 30.796^{\mathrm{m}}$	$30^{\mathrm{d}} \ 21^{\mathrm{h}} \ 51.113^{\mathrm{m}}$
λ	− 7 10.000	− 7 10.000
Local Mean Time, October	$31^{\mathrm{d}} \ 02^{\mathrm{h}} \ 40.796^{\mathrm{m}}$	$31^{\mathrm{d}} \ 05^{\mathrm{h}} \ 01.113^{\mathrm{m}}$

Therefore we have—

Beginning of the eclipse, October $31^{\mathrm{d}} \ 02^{\mathrm{h}} \ 40^{\mathrm{m}} \ 47.8^{\mathrm{s}}$ } Local Mean Time.
End of the eclipse,   "   31   05   01   06.8 }

	Beginning.	Ending.
	° ′	° ′
$N \pm \psi$	128 01.4	74 37.3
constant	+180 00.0	0 00.0
Angle of position: P	308 01.4	74 37.3

from the north point of the Sun's disk toward the east for direct image.

Moon's Phases, Libration, etc.—Page 439 gives the Washington mean times of the Moon's phases, apogee, perigee and greatest libration, together with the formulæ for finding the libration in longitude and latitude whenever required.

Mean Places of Stars Occulted During the Year.—Pages 440–443 contain, for the year 1902, the adopted mean places and annual proper motions, applicable to STRUVE's precession, of such stars as will be occulted by the Moon, but are not included in the list given on pages 304 to 311.

Elements of Occultations.—Pages 444–473 give the elements for the prediction of the times of occultations of stars and planets by the Moon during the current year. The system of co-ordinates employed is similar to that already described for eclipses, the fundamental plane passing through the center of the Earth, and being taken perpendicular

to the line joining the star and the center of the Moon, but the cone circumscribing the Moon and star is regarded as a cylinder which intercepts the fundamental plane in a circle having the same linear diameter as the Moon.

In the columns referring to the star, those headed *Red'ns from* 1902.0 give the quantities necessary to reduce the mean place of the star at the beginning of 1902 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving certain quantities for the moment of geocentric conjunction of the Moon and star in right ascension, as follows:—

The *Washington Mean Time* is the moment at which the two bodies are in geocentric conjunction in right ascension. At that moment the co-ordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour-Angle H* gives the common geocentric hour-angle of the Moon and star at the same moment, expressed in sidereal time and counted from the meridian of Washington—positive toward the west and negative toward the east. Column Y gives the co-ordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the variations of x and y in one hour of mean time. The linear unit in these columns is the Earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star relatively to the limb of the Moon may be computed for any part of the Earth by a method nearly the same as ·that already explained for computing eclipses, but somewhat more simple.

Prediction of Occultations for a Given Place.—When it is desired to predict the circumstances of one or more occultations at any place, the first step will be to select them from the general list given in the Ephemeris. The conditions of visibility are :—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H - \lambda$, taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east horizon, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The Sun must not be much more than an hour above the horizon at the local mean time $T - \lambda$, unless the star is bright enough to be seen in the day time.

When many occultations are to be selected, the most convenient course will be to write the value of $-\lambda$ on the bottom of a slip of paper, and in passing through the list of occultations, to pause over each one for which condition (1) is fulfilled, and examine by means of the slip whether conditions (2) and (3) are also fulfilled. If either fails, the computer passes on. Sometimes it will be difficult to determine whether $H - \lambda$ or $T - \lambda$ falls within the limits; and in such cases the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

The next step will be to compute the local times of immersion and emersion from the elements, and to that end let—

T = the instant of geocentric conjunction of Moon and star in right ascension, expressed in mean solar time;

H = the Washington west hour-angle of the two bodies at that moment, expressed in sidereal time;

λ = the longitude west of Washington;

$h_0 = H - \lambda$ = the local sidereal hour-angle of the star at the instant T;

δ = the star's declination.

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The procedure for each occultation will then be as follows:

(1) The geocentric co-ordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed by the formulæ and table given in connection with eclipses on page 563.

The next step will be to find the approximate instant of apparent conjunction of the Moon and star as seen from the place, and that may be deduced from the time of geocentric conjunction by the application of an approximate correction taken from Mr. Downes's table, printed in the volumes of the American Ephemeris for 1882 to 1899. This correction must be reckoned in mean solar hours, and will be designated by the symbol t. It will have the same sign as h_0.

When Downes's table is not available, the correction may be computed from the formulæ,

$$\xi_0 = \rho \cos \varphi' \sin h_0$$
$$\xi' = [9.4192] \cos (h_0 + \tfrac{1}{3} h_0)$$
$$t = \frac{\xi_0}{x' - \xi'}$$

By applying t to the Washington mean time of geocentric conjunction, as given with the elements, we shall have the Washington mean time of local conjunction within a few minutes.

(2) Compute for the instant $T + t$ the following quantities, in which t_0 is the sidereal equivalent of the mean time interval t:

$$\xi = \rho \cos \varphi' \sin (h_0 + t_0)$$
$$\eta = \rho \sin \varphi' \cos \delta - \rho \cos \varphi' \sin \delta \cos (h_0 + t_0) = \eta_1 - \eta_2$$
$$\xi' = [9.4192] \rho \cos \varphi' \cos (h_0 + t_0)$$
$$\eta' = [9.4192] \rho \cos \varphi' \sin \delta \sin (h_0 + t_0) = [9.4192] \xi \sin \delta$$
$$x = x't$$
$$y = Y + y't$$

Compute also m, M, n, N, and ψ from the equations

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$
$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$
$$\sin \psi = [0.5646] m \sin (M - N)$$

ψ being taken between the limits $\pm 90°$. Finally compute

$$\tau = - \frac{[1.7782] m}{n} \cos (M - N) \mp \frac{[1.2135]}{n} \cos \psi$$

$$\delta\tau = \frac{[6.7591] \tau^2}{n \cos \psi} \left[\eta_2 \cos (N \mp \psi) - \xi \sin (N \mp \psi) \right]$$

where the double sign is to be taken negative for an immersion, and positive for an emersion. Both τ and $\delta\tau$ thus have two values, which are expressed in minutes of time, and in order to distinguish them let those pertaining to immersion be designated respectively τ' and $\delta\tau'$, while those pertaining to emersion are designated τ'' and $\delta\tau''$. We then have for the Washington mean times of the phases

$$\text{Instant of immersion} = T + t + \tau' + \delta\tau'$$
$$\text{Instant of emersion} = T + t + \tau'' + \delta\tau''$$

These expressions are practically exact, but the corrections $\delta\tau$ seldom amount to so much as 1.5 minutes, and whenever an inaccuracy of that magnitude is permissible they may be omitted. As a check upon the results, it will be advisable to compute ξ, η, x, and

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y for the times of immersion and emersion finally obtained. If these times are correct the quantities in question will fulfill the condition,

$$\sqrt{(x-\xi)^2 + (y-\eta)^2} = 0.2725$$

If $\log m \sin(M-N) > 9.4354$, $\sin\psi$ will be numerically greater than unity, and an occultation at the given place can not occur unless the computed distance from the Moon's limb is within the errors of the ephemerides of the Moon and star.

The position-angle of the line from the Moon's center to the star, at the time of contact, is reckoned from the north point toward the east, and designated by the symbol P. It is found from the formulæ,

$$P = N - \psi + \delta P \qquad \text{for immersion,}$$
$$P = N + \psi + \delta P \pm 180° \quad \text{for emersion,}$$

where the angles $N - \psi$ and $N + \psi$ are taken directly from the computation of $\delta\tau$, and δP is got in minutes of arc from the expression

$$\delta P = \mp \frac{[9.0819]\tau^2}{n\cos\psi}\left[\eta_2(n\sin N) + \xi(n\cos N)\right]$$

In the latter formula the double sign is to be taken negative for an immersion and positive for an emersion.

The angle from the vertex, V, is also reckoned in the direction from the north toward the east, and is found from the formula,

$$V = P - C$$

where C is computed from the expression

$$\tan C = \frac{\xi + [8.2218]\tau\xi' - [4.9810]\tau^2\xi}{\eta + [8.2218]\tau\eta' + [4.9810]\tau^2\eta_2}$$

The value of τ employed in the latter formula must be so taken as to correspond with the phase for which C is required.

In the volumes of the American Ephemeris for the years 1882 to 1901 instructions are given for constructing three special tables which greatly diminish the labor of computing occultations, but as these tables should contain from 4,700 to 6,300 quantities, and as they would apply only to the place for which they were computed, it will rarely be worth while to undertake the labor of forming them. Those who desire further information on the subject may consult any one of the volumes in question.

As an example of an isolated occultation, we will compute that of ε Tauri, on January 19, 1902, for Albany, whose position is

$$\varphi = + 42° 39' 49.5''$$
$$\lambda = - 0^h 13^m 12.9^s$$

and whose geocentric co-ordinates are—

$$\rho \sin\varphi' = 9.8288$$
$$\rho \cos\varphi' = 9.8672$$

From the elements on page 445, we have

$$\begin{array}{cc} & ^h \quad ^m \\ T = & 10 \quad 33.7 \\ H = & + 2 \quad 05.1 \end{array}$$

and
$$h_0 = H - \lambda = + 2 \ 18.3$$

From Downes's Table, or from the formulæ on page 569, we find the correction, t, to the Washington mean time of geocentric conjunction, T, to be about $+ 55^m$; therefore the Washington mean time of apparent conjunction is—

$$T + t = \text{January } 19^d 11^h 28.7^m.$$

$T + t$ January	19^d 11^h 28.7^m	
h_0	$+$ 2 18.3	
t_0	$+$ 0 55.2	
$h_0 + t_0$ (in arc)	$+$ 48° 22'	
$\rho \cos \varphi'$	9.8672	
$\sin (h_0 + t_0)$	9.8736	
$\log \xi$	9.7408	
ξ	$+$ 0.5505	
$\rho \sin \varphi'$	9.8288	
$\cos \delta$	9.9758	
$\log \eta_1$	9.8046	
η_1	$+$ 0.6377	
$\rho \cos \varphi'$	9.8672	
$\sin \delta$	9.5118	
$\cos (h_0 + t_0)$	9.8224	
$\log \eta_2$	9.2014	
η_2	$+$ 0.1590	
$\eta_1 - \eta_2 = \eta$	$+$ 0.4787	
const. log	9.4192	
$\rho \cos \varphi' \cos (h_0 + t_0)$	9.6896	
$\log \xi'$	9.1088	
ξ'	$+$ 0.1285	
const. log	9.4192	
$\xi \sin \delta$	9.2526	
$\log \eta'$	8.6718	
η'	$+$ 0.0470	
$\log x'$	9.7805	
$\log t$	9.9622	
$\log x$	9.7427	
x	$+$ 0.5530	
$\log y'$	8.7160	
$\log y' t$	8.6782	
$y' t$	$+$ 0.0477	
Y	$+$ 0.2915	
y	$+$ 0.3392	

$x - \xi$	$+$ 0.0025
$y - \eta$	$-$ 0.1395
$x' - \xi'$	$+$ 0.4748
$y' - \eta'$	$+$ 0.0050
$m \sin M$	7.3979
$m \cos M$	9.1446 n
$\tan M$	8.2533 n
M	178° 58'
$\cos M$	9.9999 n
$\log m$	9.1447
$n \sin N$	9.6765
$n \cos N$	7.6990
$\tan N$	1.9775
N	89° 24'
$\sin N$	0.0000
$\log n$	9.6765
const. log	0.5646
$\log m$	9.1447
$\sin (M - N)$	0.0000
$\sin \psi$	9.7093
ψ	$+$30° 48'
const. log	1.7782
$\log \dfrac{m}{n}$	9.4682
$\cos (M - N)$	7.8787
	9.1251
$-\dfrac{[1.7782]\, m}{n} \cos (M - N)$	$-$ 0.13
const. log	1.2135
colog n	0.3235
$\cos \psi$	9.9340
	1.4710
$\mp \dfrac{[1.2135] \cos \psi}{n}$	$\mp$ 29.58^m
τ for immersion	$-$ 29.71^m
τ for emersion	$+$ 29.45

The computation of $\delta\tau$ for the two contacts is as follows:

	Immersion.	Emersion.
$N \mp \psi$	58° 36'	120° 12'
$\cos (N \mp \psi)$	9.7168	9.7016 n
$\log \eta_2$	9.2014	9.2014
$\log (1)$	8.9182	8.9030 n
(1)	$+$ 0.0828	$-$ 0.0800
$\sin (N \mp \psi)$	9.9312	9.9366
$\log \xi$	9.7408	9.7408
$\log (2)$	9.6720	9.6774

		Immersion.	Emersion.
(2)		+ 0.4699	+ 0.4757
(1) — (2)		— 0.3871	— 0.5557
log [(1) — (2)]		9.5878 n	9.7449 n
const. log		6.7591	6.7591
log τ^2		2.9458	2.9382
colog ($n \cos \psi$)		0.3895	0.3895
log $\delta\tau$		9.6822 n	9.8317 n
$\delta\tau$		— 0.48^m	— 0.68^m
τ		— 29.71	+ 29.45

		d h m	h m
$T + t$ January		19 11 28.7	11 28.7
Washington Mean Time of Phase, "		19 10 58.5	11 57.5
λ		— 00 13.2	—00 13.2
Albany Mean Time, "		19 11 11.7	12 10.7

To find δP and $\dot{P}$:

log η_2	9.2014	log ξ	9.7408	(3)	+ 0.0755
$n \sin N$	9.6765	$n \cos N$	7.6990	(4)	+ 0.0028
log (3)	8.8779	log (4)	7.4398	(3) + (4)	+ 0.0783

	Immersion.	Emersion.
log [(3) + (4)]	8.8938	8.8938
const. log	9.0819	9.0819
log τ^2	2.9458	2.9382
colog $n \cos \psi$	0.3895	0.3895
log δP	1.3110 n	1.3034
δP	— 20′	+ 20′
$N \mp \psi$	58° 36′	120° 12′
constant	0 00	+180 00
Angle of position: P	58° 16′	300° 32′

from the north point of the Moon's limb toward the east, for direct image.

Occultations Visible at Washington, pages 474–475.—Here are given in detail all the data necessary for observing every occultation of the general list which is visible at Washington during the current year.

Phenomena of Planets and Satellites, pages 476–509.—These are, for the most part, sufficiently explained in the body of the work. The following additional explanations are added for completeness :—

Disks of Mercury, Venus and Mars, pages 476–478.—The angle θ, needed in reducing meridian observations, is the angle which the arc of the great circle from the planet to the Sun, makes with the arc from the planet toward the west, reckoned in the direction west, north, east, south. This position-angle is reckoned from 0° to 360°, as in the measurement of double stars, the planet taking the place of the central star, but its measure is 90° greater than in the case of a double star.

We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Satellites of Jupiter, pages 479–503.—The abbreviations designating the phenomena are explained at the foot of each page ; the diagram is on page 479.

Satellites of Saturn, pages 504-507.—The diagram and explanations are given on pages 504 and 505, the Washington mean times of greatest elongations on pages 505 to 507, and the apparent elements of the rings on page 507.

The diagrams and ephemerides of *The Satellites of Uranus* are given on page 508, and those of *The Satellite of Neptune* on page 509.

Phenomena, pages 510-511.—The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun, are respectively the instants when the longitude of each planet differs from that of the Sun by 0°, ±90°, or 180°.

The conjunctions of the planets with the Moon, and with each other, are given in right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

Positions of Observatories, pages 512-516.—The latest available data have been used in compiling these positions, and many of them have been furnished through the courtesy of the directors of the several observatories in response to a circular issued by this office. The values given for the *Reduction to Geocentric Latitude* and *Log ρ* are based upon Col. A. R. CLARKE's elements of the terrestrial spheroid, published in 1866, from which we have—

$$\log e = 8.915\ 2515$$
$$\varphi' - \varphi = -\ 11'\ 40.44''\ \sin 2\,\varphi + 1.19''\ \sin 4\,\varphi$$
$$\log \rho = 9.999\ 2645 + 0.000\ 7374\ \cos 2\,\varphi - 0.000\ 0019\ \cos 4\,\varphi$$

PART IV.—STAR NUMBERS, APPARENT PLACES OF STARS, AND OTHER DATA, BASED ON THE CONSTANTS OF THE PARIS CONFERENCE OF MAY, 1896.

Page 518 contains the formulæ for reducing the positions of the fixed stars and for computing the star numbers, the whole expressed in terms of the notation of BESSEL and the constants of the PARIS CONFERENCE of May, 1896.

Page 519 contains the usual data for precession, nutation, obliquity of the ecliptic, and the Sun's aberration, all of which will be rendered sufficiently clear by the explanations given on pages 557-558 respecting the similar data on pages 285-286.

Pages 520-523 contain the logarithms of the *Besselian Star-Numbers A, B, C, D* for each Washington mean midnight, and pages 524-531 contain the *Independent Star-Numbers* for the same dates; to all of which the explanations given on pages 558-559 apply, except that the formulæ on page 518 must be employed instead of those on page 290.

Pages 532-543 contain the apparent positions of the four northern circumpolar stars, α, δ, and λ Ursæ Minoris, and 51 Cephei for their upper transit at Washington. The arrangement of the data is the same as on pages 312-323, and consequently the explanations given on page 559 apply here also.

Pages 544-548 contain, for every tenth upper transit at Washington, the apparent places of 25 stars, being all those embraced in the list on pages 304-311 whose declination exceeds ±78° 30', except α Apodis and the four northern circumpolar stars. For stars of less declination than ± 78° 30' the apparent places derived by using the constants of the PARIS CONFERENCE differ from those derived by using the constants of STRUVE and PETERS by quantities which never exceed 0.015ˢ in right ascension or 0.05'' in declination, and consequently, throughout that range, the places given on pages 324-399 may be regarded as correct for either set of constants; or, in other words, when using the constants of the PARIS CONFERENCE the positions of all stars not contained in pages 532-548 may be taken with sufficient accuracy from pages 324-399. The explanation on page 559, respecting the data on pages 324-399, applies also to pages 544-548.

Latitude by Observed Altitude of Polaris, page 587.—Table IV replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the Ephemeris for 1874 to 1881, and is intended for use at sea and reconnaissance on land. It is constructed upon the assumption that Polaris has a declination of +88° 47.2′, and an observed altitude of 45°, and will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

The directions for using the table are adapted to an assumed right ascension of $1^h 24.1^m$ for Polaris, but somewhat greater accuracy may be insured by substituting the right ascension for the date of observation, from pages 312–323 of this volume.

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APPENDIX.

ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1902.

Among American astronomers there are wide differences of opinion respecting the decisions of the PARIS CONFERENCE of May, 1896, and for that reason it has been thought best to give, in the American Ephemeris for 1902, two wholly distinct sets of constants for precession, nutation, aberration, and mean obliquity of the ecliptic, namely: first, those of STRUVE and PETERS, and second, those adopted by the PARIS CONFERENCE of 1896. Their values for 1902.0 are as follows:

	Struve and Peters.	Paris Conference.
Precession . . .	50.2643″	50.2568″
Nutation . . .	9.2240″	9.21**″
Aberration . . .	20.4451″	20.47**″
Mean Obliquity .	23° 27′ 06.83″	23° 27′ 07.32″

The constants of STRUVE and PETERS are employed in the quantities on pages 286 to 399, and those of the PARIS CONFERENCE in the quantities on pages 518 to 548, and thus everyone is left free to choose between them. For stars distant more than 11° 30′ from either pole, the apparent places derived by using the constants of the PARIS CONFERENCE differ from those derived by using the constants of STRUVE and PETERS by quantities which never exceed 0.015^s in right ascension, and 0.05″ in declination, and consequently throughout that region the star ephemerides given on pages 324 to 399 may be regarded as correct for either set of constants. For the four northern circumpolar stars, and twenty-five other stars whose declinations exceed ±78° 30′ two sets of ephemerides are given; one depending upon the constants of STRUVE and PETERS, and the other depending upon the constants of the PARIS CONFERENCE.

The formulæ for the reduction of stars from mean to apparent place, using the constants of STRUVE and PETERS, are given on page 290.

The nutation given on page 286, and used in the Besselian and independent star-numbers, page 303; in f', pages 295 to 302, and in the ephemerides of the apparent places of the fixed stars for every tenth transit, pages 324 to 399, is computed with the values of A' and B' given on page 290, while the nutation used in the Besselian and independent star-numbers (except f') given on pages 291 to 302 is computed with the values of A and B given on page 290.

In the daily ephemeris of the four circumpolar stars given on pages 312 to 323 the nutation is computed with—

$$A = \tau - \overset{''}{0.342\,53} \sin \Omega$$
$$+ 0.004\,10 \sin 2\Omega$$
$$- 0.025\,19 \sin 2\odot$$
$$+ 0.002\,93 \sin (\odot + 81° 56′)$$
$$+ 0.000\,25 \sin (2\odot - \Omega)$$
$$- 0.000\,11 \sin (3\odot - \Gamma')$$
$$- 0.000\,05 \sin 2(\odot - \Omega)$$
$$+ 0.000\,10 \sin 2(\odot - \Gamma'')$$
$$+ 0.000\,09 \sin (2\Gamma' - \Omega)$$
$$+ 0.000\,05 \cos \Gamma'$$
$$+ 0.000\,04 \sin 2\Gamma'$$
$$- 0.004\,05 \sin 2\,\mathbb{C}$$
$$+ 0.001\,35 \sin (\mathbb{C} - \Gamma')$$

$$B = - \overset{''}{9.2240} \cos \Omega$$
$$+ 0.0895 \cos 2\Omega$$
$$- 0.5506 \cos 2\odot$$
$$- 0.0092 \cos (\odot + 281° 15′)$$
$$- 0.0027 \cos (3\odot - \Gamma)$$
$$+ 0.0067 \cos (2\odot - \Omega)$$
$$+ 0.0024 \cos (2\Gamma' - \Omega)$$
$$- 0.0023 \sin \Gamma'$$
$$+ 0.0008 \cos 2\Gamma'$$
$$- 0.0885 \cos 2\,\mathbb{C}$$

and the result in right ascension is diminished by the quantity $f - f' = -$ 0.1866″ sin 2☾ + 0.0622″ sin (☾ − Γ″), which is the same for all stars.

The formulæ for the reduction of stars from mean to apparent place, using the constants of the PARIS CONFERENCE, are given on page 518.

The nutation on page 519 includes only the terms in ☊, 2☊, L, 2L, and 3L. This value of the nutation has been used in all the ephemerides of the Sun, Moon, and planets, in the apparent places of the stars for every tenth transit given on pages 544 to 548, and in f' on pages 524 to 531. The nutation used in the daily ephemerides of the circumpolar stars, pages 532 to 543, is computed with—

$$A = \tau - 0.342\ 16 \sin \text{☊}$$
$$+ 0.004\ 15 \sin 2\text{☊}$$
$$- 0.024\ 95 \sin 2L$$
$$+ 0.002\ 18 \sin (L + 75.3°)$$
$$- 0.000\ 97 \sin (3L + 78.7°)$$
$$+ 0.000\ 25 \sin (2\odot - \text{☊})$$
$$- 0.000\ 05 \sin 2(\odot - \text{☊})$$
$$+ 0.000\ 10 \sin 2(\odot - \Gamma'')$$
$$+ 0.000\ 09 \sin (2\Gamma'' - \text{☊})$$
$$+ 0.000\ 05 \cos \Gamma'$$
$$+ 0.000\ 04 \sin 2\Gamma''$$
$$- 0.004\ 05 \sin 2\text{☾}$$
$$+ 0.001\ 35 \sin (\text{☾} - \Gamma'')$$

$$B = - 9.2100 \cos \text{☊}$$
$$+ 0.0900 \cos 2\text{☊}$$
$$- 0.5460 \cos 2L$$
$$- 0.0210 \cos (3L + 78.7°)$$
$$+ 0.0090 \cos (L - 78.7°)$$
$$+ 0.0067 \cos (2\odot - \text{☊})$$
$$+ 0.0024 \cos (2\Gamma'' - \text{☊})$$
$$- 0.0023 \sin \Gamma'$$
$$+ 0.0008 \cos 2\Gamma''$$
$$- 0.0885 \cos 2\text{☾}$$

and the result in right ascension is diminished by the quantity $f - f' = -$ 0.1866″ sin 2☾ + 0.0622″ sin (☾ − Γ″), which is the same for all stars.

The terms of short period in the nutation given on pages 287 and 288 are included in the values of the star-numbers on pages 520 to 531. They are derived from tables XXXIV, XXXV, XXXVI, and XXXVII of Professor NEWCOMB'S *Tables of the Sun*, which give the same values as would be found from the formulæ—

$$\delta''\psi = \text{Nutation in longitude} = A''\psi$$
$$\delta''\omega = \text{Nutation in obliquity} = - B''$$

where $\psi =$ the luni-solar precession = 50.3709″, and A'' and B'' are respectively the short period terms in the expressions for A and B on page 518. By short period terms are meant all terms involving the Moon's mean longitude.

The ephemeris of σ Octantis is computed with the same values of A and B as the four northern circumpolar stars, except that the short period terms in 2☾ and ☾ − Γ are omitted because the places of the star are given at intervals of ten days.

According to the formulæ on pages 290 and 518, the star constants a, b, c, d, a', b', c', d', are computed for each star from its mean place at the beginning of the year, but if strict accuracy is required they should be computed from the star's mean place at date, and the following second order terms should be added to the usual expressions for the reduction from mean to apparent place, namely—

To $a - a_0$

$$\left.\begin{array}{l} + 0.000\ 003\ \tau^2 \sin a \\ - 0.000\ 149\ \tau^2 \cos a \end{array}\right\} \tan \delta$$

$$\left.\begin{array}{l} - 0.000\ 0650\ \tau^2 \sin 2a \\ + 0.000\ 0103 \sin 2\text{☊} \cos 2a \\ - 0.000\ 0107 \cos 2\text{☊} \sin 2a \end{array}\right\} \tan {}^3\delta$$

$$\left.\begin{array}{l} + 0.000\ 0620 \sin 2\odot \cos 2a \\ - 0.000\ 0622 \cos 2\odot \sin 2a \end{array}\right\} \sec {}^3\delta$$

To $\delta - \delta_0$

$$\left.\begin{array}{l} + 0.000\ 975\tau^2 \sin^2 a \\ - 0.000\ 023 \cos 2\text{☊} \\ - 0.000\ 080 \cos 2\text{☊} \cos 2a \\ - 0.000\ 077 \sin 2\text{☊} \sin 2a \\ + 0.000\ 040 \cos 2\odot \\ - 0.000\ 467 \cos 2\odot \cos 2a \\ - 0.000\ 465 \sin 2\odot \sin 2a \end{array}\right\} \tan \delta$$

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To $a-a_0$

$$+ 0.000\,0513 \sin (\odot + \Omega) \cos 2a$$
$$- 0.000\,0507 \cos (\odot + \Omega) \sin 2a$$
$$+ 0.000\,0097 \sin (\odot - \Omega) \cos 2a$$
$$- 0.000\,0053 \cos (\odot - \Omega) \sin 2a$$

$\left.\right\} \tan \delta \sec \delta$

To $\delta - \delta_0$

$$- 0.000\,039 \cos (\odot + \Omega)$$
$$- 0.000\,380 \cos (\odot + \Omega) \cos 2a$$
$$- 0.000\,385 \sin (\odot + \Omega) \sin 2a$$
$$- 0.000\,380 \cos (\odot - \Omega)$$
$$- 0.000\,040 \cos (\odot - \Omega) \cos 2a$$
$$- 0.000\,072 \sin (\odot - \Omega) \sin 2a$$

$\left.\right\} \sin \delta \tan \delta$

These terms are negligible for stars whose declination is numerically less than 80°, but in computing the apparent places given in the American Ephemeris they have been applied whenever sensible.

The mean places of 383 stars, pages 304 to 311, are from the new *Catalogue of Fundamental Stars, for* 1875 *and* 1900, *Astronomical Papers of the American Ephemeris,* vol. VIII, part 2, prepared in this office, principally under the direction of Professor NEWCOMB.

The apparent places of Sirius and Procyon have been corrected for the effect of orbital motion, as determined from AUWERS' investigations, and tabulated in *Astronomical Papers of the American Ephemeris,* vol. I, pages 297–298. The values of these corrections are—

Year.		Sirius.			Procyon.	
1902.0	$\Delta a = -0.034$		$\Delta \delta = +1.17$	$\Delta a = +0.037$		$\Delta \delta = -0.90$
1903.0	$\Delta a = -0.050$		$\Delta \delta = +1.07$	$\Delta a = +0.027$		$\Delta \delta = -0.97$

The ephemeris of the Sun is constructed from Professor NEWCOMB's *Tables of the Sun, Astronomical Papers of the American Ephemeris,* vol. VI, part 1.

The adopted value of the mean equatorial horizontal parallax of the Sun is 8.80″, *Paris Conference, May, 1896.*

The adopted apparent semidiameter of the Sun at the Earth's mean distance is 16′ 00.78″; while in the computation of eclipses the value given by AUWERS in the *Astronomische Nachrichten,* 1891, Bd. 128, S. 367, has been employed, viz: 15′ 59.63.″

The Sun's rectangular equatorial co-ordinates have been computed from the longitudes and latitudes by the following formulæ:—

$$X = R \cos \lambda$$
$$Y = R \sin \lambda \cos \omega - 19.3 \, R \beta$$
$$Z = R \sin \lambda \sin \omega + 44.5 \, R \beta$$

The reductions to mean equinox, 1902.0, are computed by the formulæ—

$$\Delta X = + Y \sec \omega \, \Delta\lambda \sin 1''$$
$$\Delta Y = - X \cos \omega \, \Delta\lambda \sin 1'' + Z \, \Delta\omega \sin 1'' - 9.1 \, \tau R \sin (\lambda + 186°)$$
$$\Delta Z = - X \sin \omega \, \Delta\lambda \sin 1'' - Y \, \Delta\omega \sin 1'' + 21.0 \, \tau R \sin (\lambda + 186°)$$

where the numerical coefficients are in units of the seventh place of decimals and

R = the Sun's radius vector;
λ = the Sun's true longitude;
β = the Sun's true latitude, expressed in seconds of arc;
ω = the obliquity of the ecliptic;
$\Delta\lambda$ = the reduction of longitude for precession and nutation from January 0.0 of the Besselian fictitious year;
$\Delta\omega$ = the reduction of the mean to the apparent obliquity;
τ = the fraction of the year since January 0.0 of the Besselian fictitious year.

The longitude, latitude and parallax of the Moon are derived from HANSEN's *Tables de la Lune,* London, 1857, the mean longitude being corrected in accordance with Professor NEWCOMB's *Researches on the Motion of the Moon,* Part I, page 268,* and Table XXXIV being replaced by a corrected one.

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* *Astronomical Observations made at the U. S. Naval Observatory, Washington, 1875,* Appendix II.

The semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax, π, by the formula,

$$S = 0.272\ 506\ \pi + 1.50''$$

where the constant 0.272 506 is based on data from occultations given by **Mr. J. Peters** in the *Astronomische Nachrichten* 1895, Bd. 138, S. 147; and the constant 1.50'' is added to cover the average effect of irradiation. The latter quantity is omitted in the computation of eclipses and occultations.

The ephemerides of Mercury, Venus and Mars are derived from Prof. Newcomb's tables of these planets, *Astronomical Papers of the American Ephemeris*, vol. VI, parts 2, 3 and 4.

The ephemerides of Jupiter and Saturn are derived from the tables constructed in this office by Dr. George W. Hill, *Astronomical Papers of the American Ephemeris*, vol. VII, parts 1 and 2.

The ephemerides of Uranus and Neptune are derived from Professor Newcomb's tables of these planets, published in the *Smithsonian Contributions to Knowledge*, No. 262, 1873, vol. 19 and No. 199, 1865, vol. 15.

The semidiameters of the planets are computed from the following values:—

	Semidiameter.	Log Dist.	Authority.
Mercury	3.34	0.00	Le Verrier, *Theory of Mercury.*
Venus	8.546 ± 0.086	0.00	
Mars	2.842 ± 0.057	0.25	Peirce, from the Washington Observations of 1845 and 1846,
Jupiter (polar)	18.78 ± 0.067	0.70	made with the Mural Circle.
Saturn (polar)	8.77 ± 0.039	0.95	
Uranus	1.68 ± 0.3	1.30	
Neptune	1.28	1.48	
Jupiter (equatorial)	20.00	0.70	
Saturn (equatorial)	9.38	0.95	

The elements of eclipses of the Sun and occultations of stars by the Moon are given in accordance with Bessel's method, the special forms employed being a modification of those developed in Chauvenet's *Spherical and Practical Astronomy*.

The satellites of Mars are computed from manuscript tables based upon elements deduced by Dr. W. S. Harshman. His elements of Deimos are published in the *Astronomical Journal*, 1894, vol. XIV, p. 147; but those of Phobos are yet in manuscript.

The eclipses of Jupiter's satellites are computed from a *Continuation of* Damoiseau's *Tables*, made in this office. The occultations, transits, etc., are computed from Woolhouse's tables, published in the *British Nautical Almanac* for 1835; Table II of each satellite having been adapted to Damoiseau's tables.

The fifth satellite of Jupiter is computed from manuscript tables based upon unpublished elements deduced by Mr. J. Robertson from observations by Professor E. E. Barnard.

The elongations and conjunctions of the satellites of Saturn are computed from manuscript tables prepared in this office by Mr. C. Keith. For the six inner satellites these tables are based upon Prof. A. Hall's elements, as published in the *Washington Observations*, 1883, Appendix I; for Hyperion, upon Dr. W. S. Eichelberger's elements, in the *Astronomical Journal*, 1892, vol. XI, pp. 156, 157; and for Iapetus, upon Prof. A. Hall's elements, in the *Washington Observations*, 1882, Appendix I.

The apparent elements of the rings of Saturn are computed from Bessel's data, except those for the dusky ring which are based on the observations of O. Struve, A. Hall Barnard and Lewis, at Pulkowa, Washington, Mt. Hamilton and Greenwich.

The elongations of the satellites of Uranus are computed from the data of Professor Newcomb's *Uranian and Neptunian Systems, Washington Observations*, 1873, Appendix I.

The elongations of the satellite of Neptune are computed from manuscript tables based upon Prof. A. Hall's elements published in the *Astronomical Journal*, 1898, vol. XIX, p. 65.

The following named persons were engaged in the preparation of the American Ephemeris and Nautical Almanac for the year 1902:

Assistant to the Director.—Prof. H. D. Todd, U. S. N.

Assistants and Employés.—E. J. Loomis, W. S. Harshman, H. B. Hedrick, H. L. Rice, W. Auhagen, E. C. Ruebsam, J. Robertson, H. G. Hodgkins, J. C. Hammond, J. H. Root, A. P. Rudolph, R. Keith, R. Buchanan, E. B. Davis, A. Doolittle, H. F. M. Hedrick, and C. E. Van Orstrand.

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TABLE II.—SIDEREAL INTO MEAN SOLAR TIME. 581

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	For Seconds
	m s	m s	m s	m s	m s	m s	m s	m s	s s
	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0 0.000
	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1 0.003
	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2 0.005
	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3 0.008
	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4 0.011
	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5 0.014
	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6 0.016
	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7 0.019
	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8 0.022
	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9 0.025
	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10 0.027
	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11 0.030
	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12 0.033
	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13 0.035
	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14 0.038
	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15 0.041
	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16 0.044
	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17 0.046
	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18 0.049
	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19 0.052
	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20 0.055
	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21 0.057
	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22 0.060
	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23 0.063
	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24 0.066
	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25 0.068
	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26 0.071
	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27 0.074
	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28 0.076
	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29 0.079
	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30 0.082
	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31 0.085
	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32 0.087
	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33 0.090
	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34 0.093
	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35 0.096
	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36 0.098
	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37 0.101
	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38 0.104
	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39 0.106
	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40 0.109
	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41 0.112
	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42 0.115
	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43 0.117
	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44 0.120
	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45 0.123
	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46 0.126
	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47 0.128
	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48 0.131
	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49 0.134
	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50 0.137
	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51 0.139
	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52 0.142
	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53 0.145
	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54 0.147
	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55 0.150
	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56 0.153
	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57 0.156
	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58 0.158
	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59 0.161
Sidereal	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	For Seconds

CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE ɣ MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS

Approximate Interval		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 00	3 00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	
0 50	2 10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	
1 00	2 00	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	
1 10	1 50	1	1	2	2	3	3	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	
1 20	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	
1 30	1 30	1	1	2	3	3	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14		

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS

Approximate Interval		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 00	3 00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	6	6	6	6	6	6	
0 20	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	
1 00	2 00	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	
1 10	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS

Approximate Interval		102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 00	3 00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9
0 20	2 40	13	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16
0 30	2 30	18	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23
0 40	2 20	22	22	23	23	24	24	25	25	25	26	26	27	27	28	28	28	28
0 50	2 10	26	26	26	27	27	28	29	29	29	30	30	31	31	32	32	33	33
1 00	2 00	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	37	37
1 10	1 50	30	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40
1 20	1 40	31	32	33	33	34	34	35	35	36	37	38	38	39	39	40	41	41
1 30	1 30	32	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	41

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the [...] decreasing, and subtracted when they are increasing.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.　　581

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0 0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1 0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2 0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3 0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4 0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5 0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6 0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7 0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8 0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9 0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10 0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11 0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12 0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13 0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14 0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15 0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16 0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17 0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18 0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19 0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20 0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21 0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22 0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23 0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24 0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25 0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26 0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27 0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28 0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29 0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30 0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31 0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32 0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33 0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34 0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35 0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36 0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37 0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38 0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39 0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40 0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41 0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42 0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43 0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44 0.120
45	0 7.372	0 17.202	0 27.031	0 36.86	0 46.690	0 56.520	1 6.350	1 16.179	45 0.123
46	0 7.536	0 17.366	0 27.195	0 37.	46.854	0 56.684	1 6.513	1 16.343	46 0.126
47	0 7.700	0 17.529	0 27.359	0 3	47.018	0 56.848	1 6.677	1 16.507	47 0.128
48	0 7.864	0 17.693	0 27.5.3		47.182	0 57.011	1 6.841	1 16.671	48 0.131
49	0 8.027	0 17.857			47.346	0 57.175	1 7.005	1 16.834	49 0.134
50	0 8.191	0 18.021			47.510	0 57.339	1 7.169	1 16.998	50 0.137
51	0 8.355	0 18.185			47.673	0 57.503	1 7.332	1 17.162	51 0.139
52	0 8.519	0 18.349			47.837	57.667	1 7.496	1 17.326	52 0.142
53	0 8.683	0 18.51			18.0	57.831	1 7.660	1 17.490	53 0.145
54	0 8.847	0 18.6			7.994		1 7.824	1 17.654	54 0.147
55	0 9.0					58.158	1 7.988	1 17.817	55 0.150
56	0 9.					58.322	1 8.152	1 17.981	56 0.153
57	0					58.486	1 8.315	1 18.145	57 0.156
58	0					58.650	1 8.479	1 18.309	58 0.158
59	0					58.814	1 8.643	1 18.473	59 0.161

CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.

Approximate Interval		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 00	3 00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11
0 50	2 10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13
1 00	2 00	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14
1 10	1 50	1	1	2	2	3	4	4	5	5	6	7	8	8	9	9	10	11	11	12	12	13	13	14	14	15	15
1 20	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16
1 30	1 30	1	1	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.

Approximate Interval		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 00	3 00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7
0 20	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	22
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	25
1 00	2 00	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28
1 10	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30
1 20	1 40	17	17	18	19	19	20	21	21	22	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31

DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.

Approximate Interval		102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 00	3 00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9
0 20	2 40	13	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17
0 30	2 30	18	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23	24	24
0 40	2 20	22	22	23	23	24	24	25	25	25	26	26	27	27	28	28	28	29	29	30
0 50	2 10	26	26	26	27	27	28	29	29	29	30	30	31	31	32	32	33	33	34	34
1 00	2 00	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	37	37	38	38
1 10	1 50	30	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40	40	41
1 20	1 40	31	32	33	33	34	34	35	35	36	37	38	38	39	39	40	41	41	42	42
1 30	1 30	32	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	42	42	43

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME. 581

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal. m'	0ʰ m s	1ʰ m s	2ʰ m s	3ʰ m s	4ʰ m s	5ʰ m s	6ʰ m s	7ʰ m s	For Seconds. s	s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0	0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1	0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2	0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3	0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4	0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5	0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6	0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7	0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8	0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9	0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10	0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11	0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12	0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13	0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14	0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15	0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16	0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17	0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18	0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19	0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20	0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21	0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22	0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23	0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24	0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25	0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26	0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27	0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28	0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29	0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30	0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31	0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32	0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33	0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34	0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35	0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36	0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37	0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38	0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39	0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40	0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41	0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42	0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43	0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44	0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45	0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46	0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47	0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48	0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49	0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50	0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51	0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52	0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53	0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54	0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55	0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56	0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57	0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58	0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59	0.161
Sidereal.	0ʰ	1ʰ	2ʰ	3ʰ	4ʰ	5ʰ	6ʰ	7ʰ	For Seconds.	

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal. m	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	For Seconds s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161
Sidereal.	8ʰ	9ʰ	10ʰ	11ʰ	12ʰ	13ʰ	14ʰ	15ʰ	For Seconds	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.   583

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0 0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1 0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2 0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3 0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4 0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5 0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6 0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7 0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8 0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9 0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10 0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11 0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12 0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13 0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14 0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15 0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16 0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17 0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18 0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19 0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20 0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21 0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22 0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23 0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24 0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25 0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26 0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27 0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28 0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29 0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30 0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31 0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32 0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33 0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34 0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35 0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36 0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37 0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38 0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39 0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40 0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41 0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42 0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43 0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44 0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45 0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46 0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47 0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48 0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49 0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50 0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51 0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52 0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53 0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54 0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55 0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56 0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57 0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58 0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59 0.161
Sidereal.	16ʰ	17ʰ	18ʰ	19ʰ	20ʰ	21ʰ	22ʰ	23ʰ	For Seconds.